HAND-BOOK

TO THE

COTTON CULTIVATION

IN THE

MADRAS PRESIDENCY:

EXHIBITING

THE PRINCIPAL CONTENTS OF THE VARIOUS PUBLIC RECORDS AND OTHER WORKS CONNECTED WITH THE SUBJECT IN A CONDENSED AND CLASSIFIED FORM, IN ACCORDANCE WITH A RESOLUTION OF THE GOVERNMENT OF INDIA.

BY

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MADRAS:

J. HIGGINBOTHAM.

1862.

SB251
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PRINTED BY PHAROAH AND CO., ATHENÆUM PRESS, MOUNT ROAD.

GENERAL

PREFACE.

In submitting the present Hand-Book to the public, but few observations are necessary. The compiler has simply reduced a mass of matter to a convenient form for perusal and reference. The necessity for such a condensation, will he trusts, prove a sufficient apology to the many distinguished writers, whose minutes, reports, and correspondence have been thus abridged and arranged in a continuous narrative. In the last Chapter however, which exhibits the present condition of the Cotton culture in the Madras Presidency, it has been deemed expedient to present the reader with full extracts from the letters of the Collectors of the several Districts, rather than with abstracts; as the subject matter appears to be of greater importance, inasmuch as it refers to the present condition and prospects of the country.

The large Cotton Map of the Madras Presidency, which was to have accompanied the present volume, is very nearly ready, and will be published in the course of two or three weeks. It is being executed on the same scale as Major Scott's Map (24 miles to the inch), and will comprise a full and complete delineation of all the Cotton districts, marts, roads, canals, rivers and ports in the Madras Presidency, together with a coloured representation of localities capable of producing Cotton. This Map has been prepared in the Department of Public Works, and the writer cannot but express his sense of the intelligence and zeal displayed by Mr. David

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Ross, the compiler, in the prosecution of his elaborate and exhaustive task. The Map is being carefully copied on stone by Mr. Barren, under the superintendence of Mr. Dumphy. When completed it may be obtained at the publishers, Mr. Higginbotham's and Messrs. Pharoah and Co., in the Mount Road.

MADRAS,
11*th March*, 1862. J. T. W.

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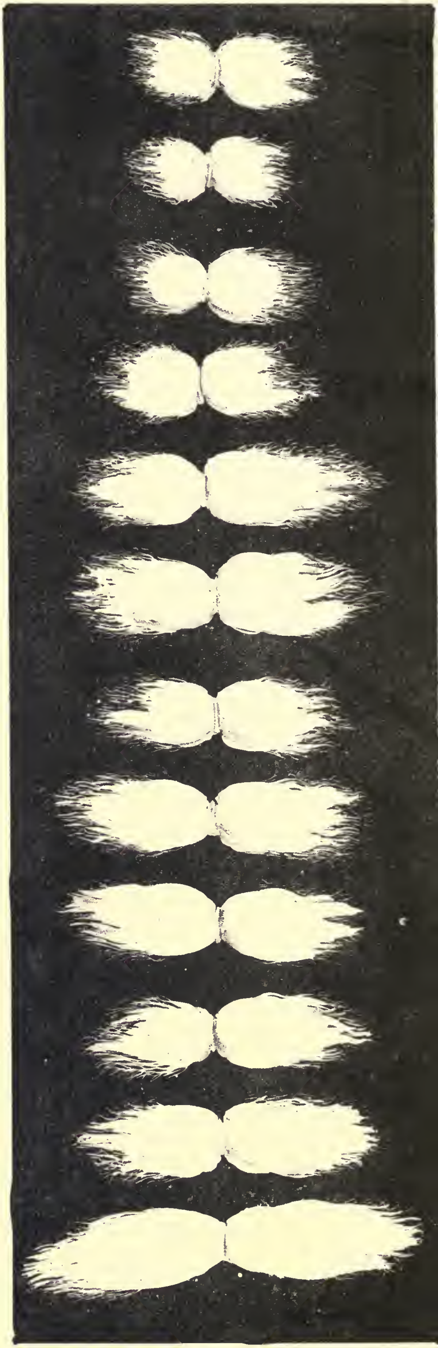
DIFFERENT STAPLES OF COTTON.



INDIAN COTTON, VIZ. 1. BENGAL.
(Gossypium Indicum)

" 2. MADRAS.

" 3. COMMON SURATS.

" 4. PRIME SURATS

NORTH AMERICAN, VIZ. 5. WEST INDIES, UPLANDS,
(Gossypium Barbadense) DEMERARA & BERBICE,
AND SMYRNA.

" 6. MOBILE & ALABAMA.

" 7 NEW ORLEANS.

SOUTH AMERICAN. VIZ. 8 BAHIA & MACEIO.
Gossypium Peruvianum.

" 9. MARANHAM & PARA.

10 PERNAMBUCO, ARACALI,
AND CEARA.

" 11. PERUVIAN.

NORTH AMERICAN VIZ. EGYPTIAN *(same size as Peruvian)*
(Gossypium Barbadence) long staple.

" 12 SEA ISLAND.

On stone by J. Suares. Lith. by Dumphy. Govt. Lith. Press. D.P.W. Chepauk.

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COTTON CULTIVATION

IN THE

MADRAS PRESIDENCY.

CHAPTER I.

GENERAL VIEW OF THE MADRAS PRESIDENCY, AND OF THE IMPROVEMENTS REQUIRED IN INDIAN COTTON.

(1.) Hand Book to the Cotton Cultivation of each Presidency ordered by the Government of India, 22nd July 1861. (2.) Method pursued in drawing up the present Hand Book to the Madras Presidency, 28th August. (3.) Three objects sought by the East India Company with reference to Cotton. (4.) Boundaries of the Madras Presidency. (5.) Physical features of the country. (6.) Three modifications of the tropical heat, viz. the table land, the sea, and the two monsoons. (7.) North-East monsoon, October to April: South-West monsoon, May to September. (8.) Climate of the Madras Presidency and Cotton States of North America compared: reversal of the seasons. (9.) Revenue divisions of the Madras Presidency. (10.) Revenue systems of the Madras Presidency: based upon the Village communities. (11.) Three Revenue systems: First, The Village joint rent system. (12.) Second, The Zemindary system. (13.) Third, The Ryotwary system (14.) Advantages of the Ryotwary tenure over the Zemindary and Village joint rent systems. (15.) Revenue division of lands: Government, Zemindary, and Inam. (16.) Nature and extent of the Cotton soils of India. (17.) Four great Cotton districts: Bellary and Cuddapah to the north; Coimbatore and Tinnevelly to the south. (18.) Statistics of the Cotton growing districts. (19.) Review of the three improvements required in Indian Cotton. (20.) First, Better variety of Cotton required: general classification of Indian and American Cottons. (21.) Six leading varieties of Cotton, viz. Indian, Bourbon, New Orleans, Pernambuco, Egyptian, and Sea Island. (22.) Indian, Bourbon, and New Orleans Cotton compared. (23.) Second, Better system of cultivation required: Indian and American agriculture compared. (24.) Third, Better method of separating and cleaning the Cotton required. The Foot Roller. (25.) The Native Churka. (26.) The American Saw Gin. (27.) The Thresher. (28.) Division of the subject matter in the present Hand-book. (29.) Twelve years of Cotton Experiments divisible into three periods of four years each. (30.) Specialities of the several Chapters.

CHAPTER I.

GENERAL VIEW OF THE MADRAS PRESIDENCY, AND OF THE IMPROVEMENTS REQUIRED IN INDIAN COTTON.

CHAP. I.

1 **Hand-Book to the Cotton Cultivation of each Presidency ordered by the Government of India, 22nd July, 1861.**—In July 1861, the Governor General in Council resolved, that one Gentleman should be appointed in each of the Indian Presidencies to analyse the contents of the various public records connected with the improvement and extension of the cultivation of cotton in his particular Province, and to publish the results in such a form as might prove useful as a Guide or Hand-book to persons interested in the subject. The compiler however was not to be limited to the public records of his Presidency. Evidence taken before Parliamentary Committees, Transactions of Scientific Bodies, Books of Travels, Special Publications like those of Dr. Forbes Royle, and indeed any work which referred to the prospects of Cotton cultivation within the Province for which the compilation was made, might be consulted by the compiler, and the facts they contained be exhibited with the other facts comprised in the public records. The Local Officers of Land Revenue or Customs were also called upon to supply official statistics of trade or cultivation, as well as any other information which might be at their disposal; Maps were to be prepared by the Public Works Department; and in short no labour or means were to be spared that were calculated to render each work a complete Hand-book to the Cotton cultivation in each Presidency.

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Above all however it was declared to be essential that the task should be completed with as little delay as possible; and upon this point the Supreme Government remarked that "an imperfect compilation, which could be available within the next six months, would be far more useful than one which thoroughly exhausted the subject, but which could not be published till a year hence."

2 **Method pursued in drawing up the present Hand-Book to the Madras Presidency, 28th August.** —By an order of the Madras Government, dated 28th August 1861, the present compiler was directed to undertake the work required by the Government of India. Every facility indicated was fully afforded, and the task was commenced without delay. Fortunately, the great mass of official records relating to the experiments undertaken by Government, had been already published in the form of Reports and Blue books; and the principal manuscript records to be consulted were those which had accumulated after the departure of Dr. Wight from India in 1853. The published records are as follows:—

Reports connected with the Proceedings of the East India Company in regard to the Culture and Manufacture of Cotton work prior to 1836. Octavo. Pages 431.

Parliamentary Return of Papers, connected with the Measures taken by the Company to promote the cultivation of Cotton in India, 1836—1847. Folio. Pages 535.

Ditto, with reference to the Madras Presidency only, 1847—1857. Folio. Pages 419.

Report from the Select Parliamentary Committee on the growth of Cotton in India; together with the Minutes of Evidence, &c. 1848. Folio. Pages 615.

Accordingly, it has been found necessary, in the first in-

stance, to make an abstract of all the papers contained in the first three of the foregoing publications, for the purposes of digestion and classification; and then, by means of this abstract, together with a constant and careful verification of the original documents, to endeavour to draw up a narrative of all the experiments which have been made by the East India Company, with reference to this all important subject; illustrated by such other information as could be obtained from the different sources, manuscript and otherwise, which were indicated by the Supreme Government; and exhibiting, in as clear and succinct a form as could be attained, all the results that were likely to be of interest or utility to persons engaged in similar enquiries or speculations.

Three objects sought by the East India Company with reference to Cotton.—The improvements which the East India Company have desired from an early period to introduce into India, are three in number, viz., 3

1st, A better variety of Cotton.
2nd, A better system of cultivation.
3rd, A better method of separating the staple from the seed, and of cleaning it for the European markets.

One or other of these objects will appear in almost every paragraph of the present Hand-book. Before however endeavouring to exhibit the experiments which have been made, and the results which have been achieved in the Madras Presidency, it will be necessary first, to glance at the specialities of the country; and secondly, to unfold more minutely the nature of the objects which the late Company have sought to attain.

Boundaries of the Madras Presidency.—The Madras Presidency may be described as an irregular triangle 4

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occupying the whole southern quarter of the great Indian peninsula. Its western side is formed by the coast of Malabar; its eastern side by the coast of Coromandel; its apex by Cape Comorin; whilst its base may be indicated by the river Kristna. In addition to this triangle however, the Presidency stretches out a long narrow arm on its north eastern corner, along the coast of the Bay of Bengal. This arm is known as the Northern Circars, and connects the Presidency of Madras with that of Bengal. Its existence on the Map, occasions that large blank to the northward of the Kristna, which is partly occupied by the dominions of the Nizam, and partly by the wild inhabitants of an unhealthy tract of hill country which is still only half explored.

5 **Physical features of the country.**—The Madras Presidency may be said to consist of a table land sloping from west to east, and from south to north; and supported on either side by a chain of mountains, known respectively as the Eastern and Western Ghauts. Each chain runs parallel with the coast on either side. The Eastern Ghauts rise at a distance of from 30 to 60 miles from the Coromandel coast, and leave the large irregularly level, and generally sandy plain of the Carnatic between themselves and the Bay of Bengal. The Western Ghauts rise much more abruptly and to a much greater height on the Malabar coast, and leave a much narrower strip of land between themselves and the Indian ocean. The two chains running north to south gradually unite at Cape Comorin. Thus the Madras Presidency consists of a large triangular table land, sloping away from the great western wall to what may be called the eastern mounds; and from the southern territory of Mysore, which has a medium elevation of 3,000 feet, to the northern districts of Bellary and Cuddapah, where the mean height is 1,600 feet. East of the table land is the broad sandy plain of the Carnatic; west of the table land is the narrow fertile territory known as Canara and Malabar.

Three modifications of the tropical heat: viz., the table land, the sea, and the two monsoons.—The whole of the Madras Presidency is situated within the tropics, between the eighth and twentieth degree of north latitude. The entire territory therefore is subject to great heat, and this is especially the case in localities which are unrelieved by moisture. But the elevation of the table land in the centre, the vicinity of the plains to the sea, and above all the influence of the two monsoons, very much modify the burning heat of the sun. 6

North-East monsoon, October to April: South-West monsoon, May to September.—The manifestations of the monsoons are so unlike anything that is experienced in the British isles, and at the same time they exercise such an important influence on every kind of cultivation in India, that perhaps a short description may not be misplaced. The monsoons are periodical winds, which about the time of their first setting in bring heavy burst of rain. One sets in from the North-East about October, and blows more or less steadily for six months. The other sets in from the South-West about April, and blows until the North-East begins. Thus the broad plain of the Carnatic enjoys the influence of the North-East monsoon; the narrow strip of Malabar and Canara is favoured by the South-West monsoon; whilst certain portions of the table land between them enjoy a partial benefit from both monsoons. Each of these monsoons brings a supply of rain. The North-East brings less water than the other, but then its influence is more generally felt, as the Eastern Ghauts are not sufficiently elevated to shut it out from the central table land. Not so however with the South-West monsoon. That comes laden with a mass of waters from the Southern ocean, and pours a heavy torrent of rain upon the Western Ghauts; but its influence is more or less shut out from the 7

CHAP. I.

central table land by the abrupt and elevated wall of mountains. In two or three favoured localities however, and especially in the neighbourhood of Coimbatore, there are breaks or chasms in the Ghauts, through which the clouds are carried by the South-West wind, and produce a fertility which is not to be found in regions which only enjoy the benefit of the North-East monsoon. The bearing of these influences upon the cultivation of Cotton will be found largely illustrated in the following pages.

8 **Climate of the Madras Presidency and Cotton States of North America compared: reversal of Seasons.**—Before noticing the other local peculiarities of the Madras Presidency, it may be as well to compare the climate generally with that of the Cotton States of North America. We have seen that every part of the Presidency lies to the southward of the twentieth degree north latitude; and we may now add that all the Cotton States of America lie to the northward of that degree, and indeed to the northward of the thirtieth parallel. This difference of latitude is obviated by a reversal of the seasons, the Winter of India being taken as the Summer of the Cotton cultivation. In other words, whilst in America the Cotton is sown in April and gathered in September, in India it is sown in October and gathered in March and April. A further comparison of the results of this reversal of the seasons will be found further on.

9 **Revenue Divisions of the Madras Presidency.**—The Madras Presidency is divided, for the purposes of collecting the Revenue, into twenty Districts, each of which is under the charge of a Revenue Collector. These twenty Districts may be classified, in accordance with the physical division already indicated, in the following manner.

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DRAWN BY C. WINCHESTER & LITH^D. BY J. DUMPHY, GOV^T LITH^C PRESS CHEPAUK. 1862

1st. NORTHERN CIRCARS, four districts : viz.—(1) Ganjam, (2) Vizagapatam, (3) Godavari, (4) Kristna.*

2nd. EASTERN PLAIN of the CARNATIC, eight districts : viz.—(1) Nellore, (2) Madras, (3) North Arcot, (4) South Arcot, (5) Trichinopoly, (6) Tanjore, (7) Madura, (8) Tinnevelly.

3rd. CENTRAL TABLE-LAND, five districts : viz.—(1) Bellary, (2) Kurnool, (3) Cuddapah, (4) Salem, (5) Coimbatore.

4th. WESTERN STRIP, three districts : viz.—(1) North Canara, (2) South Canara, (3) Malabar.

In addition to these Collectorates, there are certain Native States which are dependent upon Great Britain : viz.—Mysore in the Central Table land, and Travancore and Cochin in the South-West corner of the Peninsula. For the sake of clearness a small sketch map is appended, exhibiting generally the frontiers of all the Revenue districts and Native States included in the Madras Presidency.

Revenue systems of the Madras Presidency : based upon the Village Communities.—In order 10
to obtain a general idea of the Revenue systems which prevail, not only in the Madras Presidency but throughout the whole Peninsula of India, it may be necessary to remark that the entire country consists of an almost endless number of village communities, or, what we should

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* Previous to the last *two* years the present districts of the *Godavari* and *Kristna* formed the *three* districts of Rajahmundry, Masulipatam, and Guntoor. The new arrangement was found convenient for many reasons, but chiefly as it kept the district watered by the river Godavari, distinct from the district watered by the river Kristna. Accordingly, the whole of Rajahmundry and part of Masulipatam were formed into the *Godavari* district; and the remaining portion of Masulipatam and the whole of Guntoor were formed into the *Kristna* district. The frequent use of the old names leads to some confusion, which may be generally avoided by regarding Rajahmundry as *Godavari*, and Masulipatam and Guntoor as *Kristna*.

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perhaps call "parishes." Each village comprises not only houses and families, but cultivated lands and waste lands. Each village has also an organisation and government of its own. Of course the bulk of each village community is composed of Ryots, or land holders; but each village has also its own officers and artisans. First of all there is the Head man, whose duties originally were to pay the yearly land tax or tribute to Government for the entire village; and who also, in conjunction with the villagers in council, allotted the lands for cultivation, apportioned the yearly contribution each one was to pay towards the Government demand, settled all disputes, and performed other Municipal duties, which need not be specified. The latter duties, and in some cases the former duties, are still performed by the Head man of the village, but this will be explained hereafter. Next to the Head man is generally the Accountant, who keeps the village records and accounts; the Watchman who guards the boundaries and watches the crops; the Money-changer, the Priest, the Astrologer, the Smith, the Carpenter, the Barber, the Potter, and the Leather-worker; and in many cases there is also the Tailor, Washerman, Physician, Musician, Minstrel (or genealogist); and, at any rate in the south, there is generally the Dancing girl. These village officers and artisans are remunerated for their services by grants of land rent-free, and by fees contributed by the Ryots, sometimes in money, but more frequently in grain. These villages have existed from time immemorial. They are essentially Hindoo institutions. To use the words of Sir Charles Metcalfe, "the village communities are little republics, having nearly every thing they can want within themselves, and almost independent of any foreign relations. They seem to last where nothing else lasts. Dynasty after dynasty tumbles down; revolution succeeds to revolution; Hindoo, Patan, Mogul, Mahratta, Sikh, English, are all masters in turn; but the village community remains the same."

Three Revenue systems: 1st, the Village joint rent system.—By bearing in mind the village communities, it is easy to obtain a general view of the Revenue sys- 11
tems which prevail in the Madras Presidency. First of all we have the relic of ancient times, the village joint rent system; in which the inhabitants of each village still pay through their Head man to the Collector of the District, a yearly lump tax for the whole of their lands; and then they are left to allot to each one of their number, the lands he is to cultivate, and the yearly contribution he is to pay. The defect in the village joint rent system is, that each villager is responsible not only for the payment of his own contribution, but virtually for the payment of the contributions of all the others; whilst at the same time there is no clear definition of his individual right to the land which he cultivates and holds.

2nd, The Zemindary system.—This system may also 12
be explained in a few words. A set of middle-men or aristocracy, arose between the Sovereign and the Head men of the villages, known by the general name of Zemindars. Some had received villages as rewards for services; others were simply farmers of the revenue; others again may have obtained villages in return for supplies of troops, or by chicanery or force during the dark days of a declining dynasty; whilst some were undoubtedly descendants of old feudal chiefs and barons, who had held possession of the villages from time immemorial. Be this as it may, we found all these Zemindars exercising proprietary rights, and paying a fixed annual sum to the existing Government. Accordingly, this Zemindary system has, in many parts, still continued to exist under British rule. The objections to it are that the Zemindar's profits swallow up from 15 to 33 per cent. of the revenue derived from the lands under cultivation, as well as the whole of any future revenue which may arise from the waste lands being taken into cultivation.

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13 **3rd, The Ryotwary system.**—The Ryotwary system is the most important of all, and the one which generally prevails in the Madras Presidency. Here the Government does not take the rent from the Head man of the village, nor from the Zemindar of a number of villages, but direct from the Ryots or village landholders. By this system every registered holder of land is recognised as its actual proprietor. He can sub-let his property, or transfer it by gift, sale, or mortgage. So long as he pays his yearly rent, the Government cannot eject him; but he can at any time throw off this responsibility to Government, by throwing up all or any part of his land.

14 **Advantages of the Ryotwary tenure over the Zemindary tenure and the Village joint rent system.**—It may perhaps place a complicated question in a clearer light, if we thus briefly indicate the advantages of the Ryotwar settlement, over the Zemindary tenure or the Village joint rent system. To revert from the Ryotwary to the Zemindary tenure would entail four evils. 1st, It would place a middle-man between the Government and the Ryot. 2nd, It would strike off from 15 to 33 per cent. of the existing revenue, which would go into the pockets of the middle-man. 3rd, It would alienate to the middle-man those waste lands, which the Ryots are being induced to take into cultivation, and which thus gradually increase the revenues of the State, and enable the Government to reduce the rent on the whole. 4th, It would place the Ryots under the powerful and injurious influence of the Zemindars. Again, to revert from the Ryotwar to the village joint rent system would entail two evils. 1st, It would annul individual property in the land. 2nd, It would render the whole of a village community responsible for the short comings of any of its individual members.

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15 **Revenue division of lands: Government, Zemindary, and Inam.**—The Village joint-rent system will shortly be abolished, and there will then remain but two leading distinctions of tenure: viz., the Zemindary and Ryotwary. A large extent of land, amounting to nearly one-fourth of the assessed area, is held as Inam; in other words, it is wholly or partially free from assessment. The origin of these lands is not unlike that of Zemindary lands. Certain fields have been given to individuals at various times, as rewards for services, or as funds for the support of pagodas, choultries (or resting places for travellers), and other charitable purposes; or from motives which were merely personal. It is believed that many of these lands were only given for life, but have been appropriated by the family; and that other Inams have been improperly created, or annexed. Accordingly, an Inam Commission has been set on foot to determine the rights of holders of Inams, and to fix a very moderate assessment, redeemable at wills where those rights are found to be invalid. This matter, however, is only of consequence so far as it serves to explain the nature of Inam lands.*

16 **Nature and extent of the Cotton soils of India.**—The principal Cotton soil of India is known as Black land, which is of various depths. Thus in Cuddapah it is found to extend to twenty or thirty feet, and generally rests, either on kunkur or lime, or else on sand. In Madura it is from four or five feet to fifteen feet in depth, and rests in many places upon rocks of black and white marbles and granite, and also upon masses of gravel. In Tinnevelly again we are told that the Black soil varies in depth from two to five feet; and in Coimbatore it is described as being from three

Collector of Cuddapah's letter, 1st July 1858. M. S.

Collector of Madura's letter, 17th July 1858. M. S.

Collector of Tinnevelly's letter. 8th Nov. 1858. M.S.

* The average rate of Government assessment of such lands as those upon which Cotton is generally cultivated, varies very considerably in each District. Thus in Bellary the average is about 1*s*. 3½*d*. per acre, whilst in Vizagapatam it is nearly 8*s*. per acre. A statement exhibiting the average rate in each District will be found in the Appendix.

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Collector of Coimbatore's letter, 18th Dec. 1858. M. S.

to six feet. This Black soil appears to be peculiarly adapted to the growth of Indian Cotton, and is to be found more or less in almost every District in the Presidency. In preparing the large Cotton Map which illustrates the present Hand Book, a sketch map of each District was forwarded to each District Engineer, with a request that he would colour those parts in which this Cotton soil prevailed. The results are accordingly exhibited in the Cotton Map, and generally serve to show the extent of land available for the cultivation of Indian Cotton. The amount of Cotton land actually under cultivation for the last eight years is also exhibited in the Appendix, under the several heads of Government lands, Inam lands, and Zemindary lands; together with the sum total of the yearly assessment of the Cotton lands of each District in Rupees. Besides however the Black soil, there are two other soils, viz., the Red and the Alluvial. These two, but especially the Red, are found to be even better adapted to the cultivation of American Cotton than the Black. This fact will be fully discussed further on. It will be sufficient to say, that should the American species ultimately prove productive and profitable, the Madras Presidency could alone furnish an almost inexhaustible supply of Indian and American Cotton.

17 **Four great Cotton Districts: Bellary and Cuddapah to the north; Coimbatore and Tinnevelly to the south.**—The present so called Cotton growing Districts of the Madras Presidency, are eight in number, viz., Kristna, Nellore, Cuddapah, Kurnool, and Bellary in the north; and Madura, Coimbatore and Tinnevelly in the south. Of these however four are the principal, and those which must especially be borne in mind, viz.—

North.—Bellary and Cuddapah.

South.—Coimbatore and Tinnevelly.

CHAP. I.

Statistics of the Cotton growing Districts.—In 1848 the following questions, drawn up by Dr. Royle, were forwarded to each Collector with reference to Indian Cotton. 18

1st. The price of Cotton, freed from the seed, in the principal mart or marts in the District.

2nd. The price at which the Ryot sells his Cotton, cleaned or uncleaned; and with or without advances.

3rd. The expense of cleaning Cotton by the churka, a foot roller,* or any other method which may be in use.

4th. The expenses of conveying Cotton to the nearest port for shipment.

5th. The average produce of Cotton per acre.

6th. The quantity of land under cultivation with Cotton, and the extent to which the cultivation could be carried, in the event of an increasing demand.

The information obtained in reply to these queries is exhibited on the table in the Appendix, which was prepared by the Madras Board of Revenue, but is now further simplified by the reduction into English money and measures. Much reliance however cannot be placed upon what is stated as regards "average produce" and "cost of culture." It has been stated that the Ryots will not tell the truth about the first; and as they keep no accounts, they cannot furnish accurate information upon the second point. In the case of a poor Ryot, the cultivation is carried on by himself and family; in the case of a rich Ryot, it is carried on by his numerous dependents, whom he merely feeds.

Parliment Return (1857) p. 36, 37.

Mr. Finnie's letters. 30th Oct. 1847, and 13th Jan. 1849. Parl. Return (1857) p. 27 & 55.

Review of the three improvements required in the Indian Cotton.—Having thus glanced at the specialities of the Madras Presidency, it will be necessary to review the three great improvements which the late Company endea- 19

* A description of the churka and foot roller will be found at paras 24 and 25.

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voured to effect in India with reference to Cotton : viz.—To introduce—1st, A better variety ; 2nd, A better cultivation ; and 3rd, A better method of cleaning.

20 **1st. Better variety of Cotton : general classification of Indian and American Cotton.**—The Cotton plant may be divided, for all the practical purposes contemplated in the present work, into three species only, which with their respective varieties may be thus briefly indicated.

1st. *Indian Cotton,* including the very short stapled varieties of Bengal, Madras and Surat.

2nd. *North American Cotton,* including, first, the short stapled varieties of New Orleans (Mexican), West Indian, (Bourbon ?), Uplands, and Boweds ; and, second, the long stapled variety of Sea Island Cotton, which is said to have the longest, finest, and softest fibre in the world.

3rd. *South American Cotton,* including the long stapled varieties of Pernambuco (Brazilian) Peruvian, etc.

Besides these, there are other varieties, if not species of Cotton; such as the Cotton tree which grows in the Indian jungle; and an inferior sort of Indian Cotton, called "Nadum," which is never grown for exportation, though it is occasionally employed for purposes of adulteration. There is also the Egyptian Cotton, which was originally imported both from North and South America about forty years ago; and which deserves some special mention as some experiments have been made with it in this Presidency. But a full description of these varieties, however interesting to the scientific botanist, would serve no practical purpose in the present publication.* A glance at the frontispiece, which exhibits the various lengths of the different staples,

* For a learned and scientific dissertation on the different species and varieties of Cotton, the reader cannot do better than refer to Dr. Forbes Royle's work on the culture of Cotton in India.

will convey a general knowledge of the subject; and it may be added that the North and South American varieties exceed the Indian varieties, not only in length of staple but in fineness and softness of fibre. CHAP. I.

Six leading varieties of Cotton, viz., Indian, Bourbon, New Orleans, Pernambuco, Egyptian, and Sea Island.—With these preliminary observations we may now safely say, that for all practical purposes, the reader of the present volume will only find it necessary to retain the names of six different Cottons, viz.— 21

1st. *Indian,* which is indigenous to the soil.

2nd. *Bourbon,* so named from having been grown in the Isle of Bourbon, where it is supposed to have been introduced by the French from the West Indies. It was first cultivated in India during the latter part of the last century and commencement of the present.

3rd. *New Orleans,* which is sometimes alluded to as Mexican, and even as American. This was the Cotton which the late Company more particularly desired to introduce into India.*

4th. *Pernambuco, or Brazilian,* upon which some experiments are still being made by private individuals. This Cotton is marked by the peculiarity of its seeds, which adhere together in conglomerations.

5th. *Egyptian,* which has been tried with some success in the Madras district.

6th. The *Sea Island,* which is cultivated on a range of islands lying along the coast of South Carolina and Georgia.†

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* Dr. Wight tried other sorts, including Pernambuco; but it will be seen that the great object of his experimental farms was to grow New Orleans Cotton.

† A still clearer idea of the different varieties of Cotton may be gathered

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22 **Indian, Bourbon, and New Orleans Cotton compared.**—Besides the differences between the staple of the Indian and New Orleans Cotton, there are some other peculiarities which are well worthy of notice. The Indian is a stunted plant, which seems as though it formed a degenerate species. It rarely rises above three feet from the ground, and sometimes scarcely a foot; and its branches in the same way spread out only from one foot to three. The Bourbon, which was originally brought from the Mauritius, about the latter end of the last century, rises to about the same height as the Indian, but then it spreads out its branches much more. The New Orleans however rises to a far greater height than either the Bourbon or the Indian, and spreads out its branches a great deal more than either. But the root of the New Orleans does not strike so deeply into the ground as either the Bourbon or the Indian; and consequently it is less able to bear a protracted drought than either one or the other. This fact may be found useful in explaining some of the results attendant upon the experimental culture which we shall presently have to record.

Letters from the Collectors of Cuddapah, Bellary, Madura, Tinnevelly and Coimbatore, supplying information for Professor Mallet 1858, M. S. records.

23 **2nd, Better system of Cultivation: Indian and American agriculture compared.**—The differences between American and Indian culture will be largely illustrated in the present volume; but it may be as well to state here generally that they chiefly lie in the

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from a consideration of the different manufactured goods in which they are employed. Thus the finest qualities of Cotton, or those of the Sea Island class, are worked into lace and muslin of the most beautiful texture. Other qualities,—Egyptian, New Orleans, and Boweds,—are made into cambrics and calicoes for printing, as well as into shirtings, sheetings, and fustians; and, when mixed with the better kinds of waste, into bed covers and heavy fabrics. But East Indian Cotton is rarely at present used alone, except for the lowest purposes, because of its general inferiority; and it is generally disposed of in adulteration. Bazley's Lecture upon Cotton, p. 29. We might however remind Mr. Bazley that very beautiful muslins are still manufactured by the Native weavers at Dacca and Arnee.

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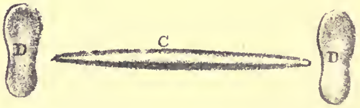
THE FOOT ROLLER



A. *A smooth stone.*

B. *A stool.*

C. *An Iron.*

DD. *Wooden soles.*

E. *The Seed.*

F. *The Cotton.*

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degree of attention bestowed upon the land. The Americans practise deep ploughing, are careful in the selection of seed, and sow on ridges, keeping the plants wide apart, and carefully destroying all weeds. The Indian Ryots on the other hand, frequently sow their Cotton broad cast, and often with three or four other crops; they allow the plants to grow too closely together, the weeds to flourish, and the wool too hang long after the seed is ripe. In some localities however they sow in drills, plough the land previous to sowing, hoe weeds away whilst the plant is growing, and take care to have a rotation of crops. When this is the case, says Dr. Royle, the Cottons are superior to those produced by more careless cultivators.

Dr. Royle's Culture of Cotton in India, p. 215.

3rd.—Better method of separating and cleaning the Cotton: 1st, The Foot Roller.—Cotton grows in a pod. 24
When the fruit is ripe the pod bursts, and discloses the seed enveloped in a kind of soft white fibre, which presents all the appearance of a particularly fine and dazzling wool. Two operations are necessary to render this wool, or staple as it is called, available for the carder and spinner:—first, to separate it from the seed; and secondly, to clean it from any extraneous matter, which may have adhered to it in the processes of gathering and separation. The proverbial simplicity of the tools and engines employed by Hindoo artisans and mechanics generally, is strikingly displayed in both operations in India. In ancient times the Natives literally separated the wool from the seed with their feet, and then cleaned it with their hands. This practice still lingers in the Southern Mahratta country. The Cotton is placed on a flat stone. A woman sits on a stool before it. Her only implement is an iron roller, but wooden soles are fastened to each of her feet. This iron roller she places on the Cotton, and then rolls it backwards and forwards with her feet, until the wool is fairly separated from the seed, and the seed is rolled out in front, whilst the Cotton wool comes out under the stool

Letter from Mr. C. Lush 4th December 1835, Cotton Reports (1836) p. 294.

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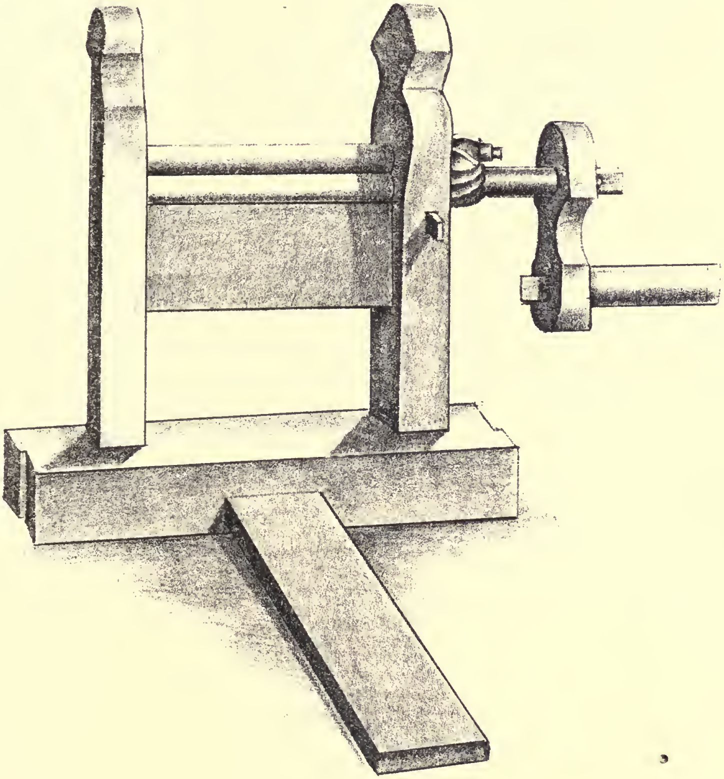
behind in a continuous web. If the woman cleans this wool with her hands,—picking away all the dirt, pieces of leaf, stray seeds, smashed seeds, and other objectionable trash,—she produces after a great expense of time and labour, a wool which is easily spun into clothing for the family, whilst the seed is used as food for the cattle.

25 **The Native Churka.**—The foot roller however has almost vanished from the Madras Presidency, and the machine now in general use is the Churka. This simple implement is only one step in advance of the foot roller. It consists of two rollers set in a wooden frame, with a small interval between them. These are turned with an ordinary handle, the motion of one being communicated to the other by a sort of endless screw. The Cotton is passed between these rollers, and the staple is thus separated from the seed; but the wool is turned out in a matted state, with the fibres all lying confused in different directions, so as to give a great deal of trouble to English carders. Moreover the wool is mixed up with all the dirty bits of leaf and seed already indicated. The Natives however can completely clean it by the laborious process of hand picking, and they appear to resort to this process for home consumption; but for exportation, they seem to content themselves with beating it with sticks on rattan frames, of which an amusing account will be found in para 177.

Letter of Messrs. Munro and Morrison, Carding and Spinning Masters, 9th February 1848, Parl. Return (Bengal 1857) p. 369.

26 **The American Saw Gin.**—The American Saw Gin is a totally different machine, and is the result of capital, ingenuity, and enterprise. It both separates the Cotton from the seed, and cleans the staple. It consists of a number of thin wheels, the edges of which are cogged or toothed; but perhaps the term "sawed" is more expressive, as the teeth are sharp, pointed downwards, and act like a saw. These circular saws are to separate the Cotton wool from the seed. The larger gins contain sixty circular saws, which are turned

THE CHURKA



ON STONE BY J SUARES. LITH. BY DUMPHY. GOVT LITH PRESS DPW CHEPAUK

round by cattle machinery. The process of separation is thus performed. Each thin circular saw passes in every revolution through a corresponding narrow grating,* so narrow indeed that whilst the wool passes through with the saw, the seed is cut off by the grating and left behind. The Cotton is accordingly placed in a trough or hopper above the saw wheels. The wheels as they turn round carry away the Cotton, and as they pass through the grating they separate the wool from the seed. Meantime a cylinder surrounded with brushes revolves in an opposite direction, and not only brushes away the wool from the saw wheels, but cleanses it from all impurities. The attempts which have been made to adapt this machine to Indian Cotton, and to invent some other Cotton cleaning machine, which should combine the perfection of the saw wheels and brush wheel with the cheapness and simplicity of the churka, will be illustrated in the following pages.†

The Thresher.—This machine was originally intended 27
to purify the seed Cotton from leaves and trash prior to ginning; for though the brush wheel of the saw gin sufficiently cleaned the wool, yet it was found that the gin worked more easily if the principal trash was thrown off prior to the submission of the seed to the action of the saws. The thresher consists of a large trough or hopper in which two or three cylinders revolve, being turned round by the same motive power which turns the gin. The seed Cotton is thrown into this trough, and thereupon is rendered so loose and lively by the action of the cylinders, that the trash falls off, and passes through a grating in the bottom of the trough into a receptacle below. The seed Cotton thus purified is removed

* Description of Whitney's Saw Gin. Cotton Reports (1836) p. 430. Here, as elsewhere, the compiler has indicated the sources of his information, though he has found it necessary to express himself in totally different language.

† A description of the Cottage saw gin will be found at para 245, accompanied by an illustration. This will be found sufficient to explain the principle of the American gin.

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through a door at the side, and placed in the hopper of the saw gin. The question to be decided is, whether the thresher would not be found useful in clearing off the trash from Indian seed Cotton, prior to submitting it to the action of the churka. This point will be discussed in the fifth chapter.

28 **Division of the subject matter of the present Hand Book.**—Having thus glanced generally at the specialities of the Madras Presidency, and the nature of the objects which the late Company have sought to accomplish, it is advisable, for the sake of clearness, to notice those salient points in the following narrative, which form the ground-work of the division of the subject matter. The early efforts of the East India Company for the extension and improvement of the Cotton culture in India, are chiefly interesting in an antiquarian point of view. Accordingly they occupy but a very small portion of the present volume. The bulk of the work consists of a detail of facts and opinions elicited during the experiments which were carried out in this Presidency, between the years 1841 and 1853, partly by practical American Planters, and partly by the eminent scientific botanist Dr. Wight, who throughout the greater part of these twelve years held the post of Superintendent. After a few preliminaries, the Experimental Farms were fairly established in this Presidency in 1841, during the Governorship of Lord Elphinstone; and the cultivation of American Cotton, and employment of American saw gins, were carried on during four years by three Planters and an Engineer, under the superintendence of Dr. Wight in the district of Coimbatore. At the expiration of that period, that is in 1845 when the Marquis of Tweeddale was Governor, some modifications were made in the experiment. One of the Planters died, and the two others were transferred to Bombay; but another Planter named Finnie, who had been originally deputed to Bengal, was engaged for four years longer by the Madras Go-

vernment. Instead however of joining Dr. Wight at Coimbatore, Mr. Finnie was located in Tinnevelly. Thus another period of four years passed away, extending from 1845 to 1849, during which Mr. Finnie was engaged in Tinnevelly and Dr. Wight in Coimbatore. But towards the end of this second period, a serious disagreement broke out between Dr. Wight and Mr. Finnie. About the same time, the Marquis of Tweeddale was succeeded by Sir Henry Pottinger. The new Governor seems to have been thoroughly dissatisfied with the progress of the Cotton experiment; and in 1849, Dr. Wight's Farm at Coimbatore was suddenly ordered to be given up, and Mr. Finnie was informed that the term for which he had been engaged was nearly over, and that when over, his services would be no longer required. The same year however, the Court of Directors sent out a despatch, approving of the steps taken with reference to Mr. Finnie, but directing the Madras Government to re-instate Dr. Wight in his position as Superintendent of the Cotton experiment. Thus a third period of four years passed away; at the expiration of which in 1853, the experiment was finally brought to a close. Dr. Wight retired from the service and returned to Europe; and the Government withdrew from all direct attempts to promote the cultivation of American Cotton, or to extend the use of foreign machinery in this Presidency.

Twelve years of Cotton Experiments, divisible into three periods of four years each. 29 —From the foregoing particulars, it will be seen that the narrative of the Cotton experiments naturally separates itself into six chapters. The first chapter comprises a description of the field of operations, and a review of the objects sought. The second chapter comprises a brief review of the early experiments which had been undertaken in reference to the subject; and a narrative of the agricultural proceedings of Dr. Wight and his three Planters in the Cotton Farms in Coimbatore, during the four years extending from 1841 to 1845. The third

CHAP. I. chapter comprises the narrative of Dr. Wight's proceedings alone in Coimbatore from 1845 to 1849. The fourth chapter comprises the narrative of Mr. Finnie's proceedings in Tinnevelly during the same period. The fifth chapter comprises a review of the discussion between Dr. Wight and Mr. Finnie, a brief narrative of the circumstances which led to the stoppage of the experiment by Sir Henry Pottinger's Government, and the renewal of the experiment by the Court of Directors; together with the last proceedings of Dr. Wight down to his final retirement in 1853. The sixth and last chapter is devoted to a short sketch of the present condition of the Cotton culture in the Madras Presidency.

30 **Specialities of the several Chapters.**—Having thus mapped out the subject, it may be as well to indicate the specialities of the several chapters. On the matter of the first chapter nothing need be said, as it is purely of an in-introductory character. The second and third chapters, which comprise a narrative of Dr. Wight's experimental culture in Coimbatore, will be found chiefly useful as exhibiting the results of Dr. Wight's scientific experiences respecting the adaptability of the American plant to the climate and soil of India. The fourth chapter, comprising the story of Mr. Finnie's proceedings in Tinnevelly, will be found useful in a totally different way; namely, as exhibiting the experiences of a practical man, both as regards the relative conditions of Cotton cultivation and trade in America and India, and the nature of the difficulties in the way of introducing into the Madras Presidency the general culture of American Cotton, and the general employment of American machinery. The fifth chapter is a gathering of results, which are illustrated by the discussions between Dr. Wight and Mr. Finnie, the proceedings of Sir Henry Pottinger's Government, and the decisions of the Court of Directors. The last chapter, and the appendices, are chiefly important as bringing down the general results to the present day.

CHAPTER II.

FOUR YEARS OF EXPERIMENTAL CULTURE UNDER DR. WIGHT AND THE AMERICAN PLANTERS, 1841 TO 1845.

(31.) Stoppage of demand for Indian Muslins and Calicoes, but growing demand for Cotton Wool. (32.) Early efforts to extend and improve Indian Cotton. (33. Introduction of Bourbon Cotton into the Madras Presidency. (34.) Mr. Metcalfe, an American Cotton cleaner, sent to the Presidency, 1813: efforts of the Madras Government, 1819—1836. (35.) Ten American Planters sent to India, 1840. (36.) Prevailing opinions upon Cotton Culture in the Madras Presidency. (37.) Three Planters located in Tinnevelly, October 1840. (38.) Contemplated removal of the Planters to the neighbourhood of Mr. Fischer's establishment at Salem. (39.) First Season, 1841-42: commenced under Captain Hughes. (40.) Reported failure in consequence of a heavy Monsoon, January 1842. (41.) Sudden renovation of the crop: Dr. Wight succeeds Captain Hughes, February. (42.) Relative effects of the Monsoon, the Drought, and the Rain, upon the Cotton shrub: difference between the Red and Black soils. (43.) Results of the season 1841-42. (44.) Dr. Wight's plan of operations: introduction of American Culture more important than that of American Cotton. (45.) Early trials of the American saw gin. (46.) Second Season, 1842-43: arrangement of the Four Experimental Farms. (47.) Three varieties of land, viz.; Black, Red, and Alluvial. (48.) Distribution of soil amongst the Four Farms: Method of Cultivation.

DR. WIGHT'S "NOTES ON AMERICAN COTTON CULTURE AS PRACTISED ON THE GOVERNMENT COTTON FARMS."

(49.) Drill husbandry: land ploughed and cast in ridges, eight or ten inches high, at intervals of about five feet. (50.) Sowing in a furrow of about two inches deep along the centre of each ridge. (51.) Scraping out of superfluous plants and weeds. (52.) Banking up the ridges, first with the plough and afterwards with the hoe. (53.) Keeping down extraneous vegetation until the crop ripens. (54.) Native ploughs and American ploughs compared: question of whether American Cotton would thrive without ridging.

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(55.) Results of the Second Season on the Black, Red and Alluvial soils, 1842-43. (56.) Comparison of the growth of the Indian, New Orleans, and Bourbon Cotton. (57.) Reports of the English Brokers on Dr. Wight's Cotton. (58.) Oopum (Indian) Cotton. (59.) New Orleans. (60.) Bourbon. (61.) Third Season, 1843-44: state of the Cotton Farms, Gins, and Gin-house. (62.) Unfavourable results: their causes. (63.) Comparison of the Crops of the third Season with those of the second. (64.) Fourth Season, 1844-45: experiment of treating the plant as a biennial. (65.) Comparative produce of the four Seasons. (66.) General Results of the four Seasons of the Experimental Farms: necessity for a rotation of Crops. (67.) Causes of the success of Mr. Wroughton's Cotton experiment. (68.) First, Influence of both monsoons. (69.) Second, Early preparation and sowing. (70.) Drought and Grate the only dangers to be avoided. (71.) Question of manure. (72.) Three advantages possessed by India over America in the cultivation of American Cotton. (73.) Remunerative demand alone required in India. (74.) Cost of cultivation. (75.) Further proceedings of the Fourth Season, 1844-45. (76.) Mr. Simpson's Report on the districts of North Canara, bordering on Dharwar. (77.) Soondah: unfavourable from the presence of "Kunkur." (78.) Soopah: soil favourable but climate unfavourable. (79.) Mr. Simpson's opinion on the failure of the Coimbatore Farms to extend the culture of American Cotton. (80.) Recommends the appointment of a practical person to distribute seed and exhibit the gins. (81.) Mr. Simpson's suggestions approved: his transfer to the Bombay Presidency. (82.) Dr. Wight's answers to the queries of the Marquis of Tweeddale. (83.) Superiority of the American Cotton to the Indian. (84.) Extension of the improved methods of cultivation among the Ryots. (85.) Reluctance of the Ryots to adopt the saw gin.

CHAPTER II.

FOUR YEARS OF EXPERIMENTAL CULTURE UNDER DR. WIGHT AND THE AMERICAN PLANTERS, 1841 TO 1845.

Stoppage of demand for Indian muslins and calicoes, but growing demand for Cotton wool.—During 31
the latter part of the last century, the conflict between the East India Company and the Native powers, was equalled by the rivalry between the Cotton manufacturers of Great Britain and the Native weavers of India. The result in both cases was the same. Whilst the Native princes were yielding to the superior prowess of the British arms, the Native weavers were conquered by the Spinning Jenny and Power Loom. The Arkwright machinery indeed seemed to defy all opposition. As early as 1793, British muslins were equal in appearance to those of India, whilst the patterns were far more elegant, and the cost was less than one-third. But at the same time, that demand for the raw wool had sprung up, which in the present day has reached such enormous limits. In 1697 the yearly import of Cotton wool into great Britain, was only 2 millions of pounds. In 1775 it reached 8 millions, and within ten years the improved machinery had raised the import to 20 millions. But the present century has perhaps witnessed the most extraordinary increase. In 1800 the yearly import was nearly 60 millions; in 1820 it was 150 millions; in 1840 it was 500 millions; and in 1860 it was 1500 millions. Hitherto the American supply has generally been equal to the demand; and Whitney's saw gin has done nearly as much for the States in the preparation of Cotton wool, as Arkwright's machinery has done for Great Britain in the manufacture of Cotton goods.

SelectCommittee of the Court of Directors quoted by Royle.

ExtractPapers relative to American tariff, laid before Parliament in 1828. CottonReports of East India Comp. (1836) p. ix.

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32 **Early efforts to extend and improve Indian Cotton.**—From an early period the Directors of the late Company were naturally anxious that India should take a part in the supply of Cotton. In 1788, during a temporary calm in political affairs, the Directors ordered 500,000 lbs. of the best Indian Cotton, and obtained reports from the Revenue Collectors of the several Districts;* but in the end only a small quantity of very indifferent Cotton was obtained from Bombay. Still however the Directors were not disheartened; and in 1790, and for some years afterwards, Dr. Anderson was engaged at Madras in distributing a variety of foreign Cotton seeds, obtained from Malta and the Mauritius, throughout the Peninsula of India.

Despatch of Court of Directors to Governor General 20th Aug. 1788. Reports on Cotton wool (1836) p. 3.

33 **Introduction of Bourbon Cotton into the Madras Presidency.**—One important result followed Dr. Anderson's labours, namely, the introduction of Bourbon Cotton; and this variety subsequently became naturalised in three Southern Districts: viz.—Tinnevelly, Salem, and Coimbatore. This success is in a great measure to be ascribed to the enterprise of a private merchant named Hughes, who resided in Tinnevelly. Mr. Hughes seemed born with a genius for developing the resources of a country. For a long time his Senna was widely celebrated as the best in the world. His cultivation of Bourbon Cotton was, however, a still greater triumph; and for more than twenty years "Hughes's Tinnevelly Cotton" continued to be quoted in the Liverpool market as the best in India; and it was actually sold at higher prices than the American short stapled Cottons, and three pence per lb. above the best Surats.

Royle's Memoirs. Parl. Return (1847) p. 28. Personal knowledge obtained from authorities on the spot

34 **Mr. Metcalfe, an American Cotton Cleaner, sent to the Presidency, 1813: efforts of the Madras Government, 1819—1836.**—Meantime the Court of Directors were anxious to extend the cultivation of Cotton, and

Despatch from Court of Directors, 7th May 1813, Cotton Reports (1836) p. 50.

* Extracts from these obsolete Reports may be found in the Appendix to the Reports on Cotton Wool, 1836.

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to improve the condition of the wool. Accordingly in 1813, they sent out Mr. Bernard Metcalfe, a Cotton Cleaner from Georgia and New Orleans, to experimentalize with some American saw gins in the Cotton growing districts of Tinnevelly, Bellary, and Cuddapah. But the attempt failed, as the Natives refused to give up their time-honoured churka, for such expensive and new fangled machinery as the gin. About the same time, the Commercial Residents in the service of the Company appear to have interested themselves in the Cotton question; for it will be remembered that in those days the Company was a Mercantile body as well as a Political power. In 1819, Mr. Rundall, the Commercial Resident in Bellary and Cuddapah, drew up a Memorial upon Cotton cultivation, in which he urged the introduction of Cotton from Bourbon, Brazil, and New Orleans. Accordingly, the Madras Government established four Cotton Farms of four hundred acres each: viz,—two in Tinnevelly and Coimbatore in Southern India; and two in Masulipatam* and Vizagapatam in the Northern Circars. Each Farm was placed under the direction of the Commercial Resident of the district. Of these the Farm at Vizagapatam proved the most successful; for there the Commercial Resident, Mr. Heath, had largely profited by the instructions which he had received from Mr. Hughes of Tinnevelly.† In the pre-

Letter from Bombay Govt. to Court of Directors, 18th Dec. 1816. Cotton Reports (1836) p. 61.

Letters from Madras Board Trade. 27th May 1819. Cotton Reports (1836) p. 87.

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* Now included in the Godaveri district. See para 9.

† Mr. Hughes's method of cultivating Bourbon Cotton in India is worthy of notice, inasmuch as reference will be made to it hereafter. His own account is arranged under the heads of soil, climate, culture, pruning, and cleaning. (1.) As regards Soil, he asserted that the Red and Brown Loams formed the most suitable and fruitful. Rich, heavy, retentive, stiff soils did not answer; for though the plants might be luxuriant, yet they were apt to produce wood and leaf, rather than fruit buds. Black Cotton soil, he declared, was to be entirely avoided for the Bourbon Cotton. (2.) As regards Climate, Mr. Hughes believed that the free admission of light winds, and the free circulation of air, were of the greatest benefit; and that situations near the sea, or within the influence of the sea breeze, were to be preferred. A dry soil and a dry atmosphere from March to May, and from July to September, seemed essential both to the good quality of the wool and the productiveness of the plant. (3.) As regards Culture, Mr. Hughes had ascertained that the plant would continue many years; that is, the plant might be cul-

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sent day the Cotton grown in Vizagapatam is insufficient for the home consumption of the province, and consequently supplies of Cotton wool are imported from the Godavari district. In 1836, Dr. Wight was appointed by the Madras Government to report on the state of agriculture in Southern India; and he subsequently represented that the returns of Cotton per acre were greater in Vizagapatam than in any other district. But these early reports and proceedings are of small importance, in the face of the large experiments which were conducted through the agency of American Planters, and which we shall now proceed to record.

Letter of the Directors, 15th Mar. 1839. Parl. Return (1847) p. 2.

35 **Ten American Planters sent to India, 1840.**—In 1840, the Court of Directors engaged ten Planters or Overseers from the Cotton states in North America, to instruct the Natives of India in the cultivation and cleaning of Cotton. This measure was initiated with considerable difficulty. Captain Bayles of the Madras Army, who had been deputed to the Cotton states for the purpose, managed to keep his secret for some time; but after he had engaged a

tivated as a perennial. The plants should be sown eight feet apart, in rows which should be again eight feet asunder; in order to afford facility for ploughing and hoeing, and for a free circulation of air. If the sowing could be effected in September, the young plant would be able to resist the continued wet of a heavy monsoon. Little was gained by sowing in October, November, or December; but the intervals of clear weather in those months answered well for transplanting; and the first week of January very well, both for sowing and transplanting. (4.) Pruning should be practised twice in the year. The first and most important pruning should take place between the 15th and 31st of December, when the shrub is cut down to two feet high and two feet wide, only the firm wood being left with the strong white and brown bark. In January during the fine days the plantation should be ploughed thoroughly three or four times. In less than two months the whole of the plants will be again in the finest foliage and full blossom, and continue in full bearing throughout the months of March, April, and May. Early in June a good many pods still remain, and a second pruning should be practised of the long, straggling, twisted soft shoots with diminutive pods. Subsequently from July to September good produce may be obtained, unless the plants are damaged by rain. (5.) Cleaning was practised on Mr. Hughes's plantation in a most careful manner, the wool being cleaned by hand.

It must however be remarked that Mr. Hughes calculated this Cotton to cost him about twelve pence a pound; but then in 1817, it was sold in London for more than two shillings per pound. See Mr. Hughes's instructions to Mr. Heath. Royle's Cotton Culture, p. 227.

few Planters, and purchased a sixty saw gin, a model gin house, and other machinery, the object of his mission eked out. The violent opposition which he then had to encounter, compelled him to carry arms, and to labour under the constant fear of being forced to use them; and the virulent attacks of the press at Natchez, combined with a sense of the lawless state of the community, and the urgent representations of friends, induced him to retreat the moment he had effected the objects of his journey. The Planters thus engaged were each to receive £300 per annum, and a gratuity in the event of success. Three were deputed to the Madras Presidency, viz: Mr. Morris, Mr. Hawley, and Mr. Simpson; and about October 1840, these gentlemen reached their destination.

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Parl. Return (1847) p. 27.

Parl. Return (1847) p. 305.

Prevailing opinions upon Cotton Cultivation in the Madras Presidency.—At this time it was the general opinion, that nothing was wanting to promote the cultivation of Bourbon Cotton but a remunerative price. In Coimbatore for instance, the Ryots at first had manifested a distaste for its cultivation, because:—1st, The seed contained no oil, and therefore the cattle would not eat it;* 2nd, The demand was fluctuating; and 3rd, The thread was too fine for Native manufacturers. But when it was found that the Bourbon Cotton produced double the crop per acre of the Indian Cotton, then we are told that the cultivation began to increase. But still the Ryot received no more for Bourbon than for Indian; and in fact only received about 2¼d. per lb. whilst the exporter realised from 6d. to 11d. As regarded 36

Despatch of the Directors, 2nd July 1840, Parl. Return (1847) p. 23. Minute of Mr. Sullivan, 25th April 1840, Parl. Return p. 52, Dr. Wight's letter 21st February, 1840, Ibid p. 40.

* Captain Taylor has pointed out that this objection is a fallacy, and that cattle will eat the seed of American Cotton. He mentions that on one occasion a Native Farmer urged the objection, when the experiment was immediately tried by placing a basket of American seed before a Buffalo. The Buffalo at once began to eat the seed, and Captain Taylor states that the objection accordingly died away in that quarter, and that the growth of American Cotton was considerably extended. Essay on the Cultivation of Cotton in India. Other authorities state that Buffaloes will not eat the American seed until they are half starved.

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Indian Cotton, it was the general opinion that it had greatly deteriorated. In olden time very much stress was laid upon quality. The Indian manufacturers were themselves the purchasers, and gave prices according to quality. Then again, when the Company received much of their rents in Cotton, the Agent would receive none but what was good and clean. Subsequently however, the Cotton was no longer bought direct by manufacturers but by brokers; and thus quantity rather than quality became the primary object of the grower. It may however be remarked generally, that the condition of Indian Cotton has been gradually improving of late years. The Natives may be timid and suspicious, but they are just as alive to their own interests as any European.

37 **Three Planters located in Tinnevelly, October 1840.**—The three American Planters reached Madras just as the season for sowing was over. They were however dispatched to the Tinnevelly district, under the superintendence of Captain Hughes, for the purpose of familiarising themselves with the native mode of cultivation, as well as with the character of the people. At Tinnevelly the Ryots were invited by proclamation to come forward and receive instruction from the American Planters; and accordingly some Ryots about two miles off, requested the attendance of the Planters. The Americans proceeded to the locality, and pointed out the defects in the native mode of gathering the seed Cotton, and proceeded to explain their own method. The Ryots in return acknowledged the superiority of the American method, but urged that it was more laborious and expensive; and therefore they refused to adopt it, unless Government would purchase the Cotton so produced at a fixed valuation. In a word they would neither adopt the American cultivation, nor sow the American seed, unless Government would buy the produce; and the Planters found that these sentiments were pretty general throughout the Cotton growers of the district.

Minutes of Consultation, 31st October 1840, Parl. Return (1847) p. 306.

Captain Hughes's letters 30th March and 3rd April 1841, Parl. Return (1847) p. 309, 310.

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38 **Contemplated removal of the Planters to the neighbourhood of Mr. Fischer's establishment at Salem.**—The non-arrival of the gin machinery prevented the Planters from doing anything further during the season of 1840-41 in the way of preparing the Cotton wool. Meantime Lord Elphinstone, who was then Governor of Madras, decided on removing the Planters from Tinnevelly to Coimbatore and Salem, where they would be in the immediate neighbourhood of Mr. Fischer, who was a large Contractor with Native Cotton growers. Mr. Fischer however considered that the general inferiority of the Madras Cotton arose from the vicious system of trade, by which there was a succession of middlemen or brokers, from the village Chetty who made advances to the Ryot in his hour of need, up to the Dubash of the European Agent at Madras who shipped the Cotton for England. Thus after each middleman had made his own profit, the smallest modicum remained to the Ryot, who consequently had no other resource but to supply the largest possible quantity. Under such circumstances, Mr. Fischer considered that the services of the Planters might prove valuable in giving to the Ryots an improved system of cultivation, including the picking, cleaning, and embaling; but that the real difficulties in the way of raising the character of Madras Cotton were altogether beyond their control. Mr. Fischer then followed the suggestion of Lord Elphinstone, that the Planters should be removed to the neighbourhood of his establishment. On the one hand he undertook to induce those Ryots, who received advances from him, to follow the instructions of the Planters. On the other hand, his establishment would afford opportunities to the Planters of cultivating different kinds of Cotton, and would also furnish them with an American saw gin for separating and cleaning the wool.

Minutes of Consultation, 10th May 1841. Parl. Return (1847) p. 313.

Mr. Fischer's letter, 14th May 1841. Parl. Return (1847) p. 314.

39 **First Season, 1841-42: commenced under Captain Hughes.**—The Court of Directors disapproved of the ex-

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perimental cultivation being carried on with the co-operation of Mr Fischer;—1st, Because he was not in the Company's service; and 2ndly, Because they had no desire to interfere with the Cotton trade, but simply to improve the article; and the expressed views of Mr. Fischer were connected with the commercial part of the question. The three Planters were accordingly removed to the Coimbatore district to carry on independent operations. Mr. Hawley and Mr. Simpson were to cultivate 200 acres in the neighbourhood of the town of Coimbatore; and Mr. Morris was to cultivate a farm of 100 acres at Errode, about fifty-five miles to the north-east of Coimbatore.

Despatch of the Court of Directors, 2nd Nov. 1841. Parl. Return (1847) p. 318.

Captain Hughes's letters, 29th and 30th August 1841. Parl. Return (1847) p. 320, 321.

40 **Reported failure in consequence of a heavy monsoon, January 1842.**—The American seed, consisting of New Orleans and Sea Island, was sown in September. In the following January the crop appeared to be a failure. The rains of the North-east monsoon had fallen in the beginning of October, and had proved heavier than had been known for years; but on the 2nd of November the rains ceased altogether, and bright cloudless weather set in. The plants now began to wither away; the leaves gradually changed their colour to a dark copper brown and became shrivelled, when the branches and bolls began to drop off, and the plant either died, or put forth new shoots and blossoms which again fell. At this period the plants on the Red soil did better than those on the Black. Meantime the Planters took a gloomy view of the whole experiment. Mr. Morris expressed his opinion that New Orleans Cotton never would grow in India. Sea Island might, he thought, be produced upon the sandy coast, near tide water, so that the land might be manured with salt mud mixed with shells, and enjoy the benefit of the sea breeze. As regarded Indian Cotton, Mr. Morris saw no chance of improving it; and he believed that the Native mode of cultivation was best adapted to the Native plant.

Mr. Morris's letter, 22nd December 1841. Parl. Return (1847) p. 328.

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Sudden renovation of the crop: Dr. Wight succeeds Captain Hughes, February.—On the 24th February 1842, Dr. Wight succeeded Captain Hughes in the Superintendence of the American Planters. But meantime a great change had taken place in the crop. The bright cloudless weather, which had lasted from the 2nd November until the 15th of January, was succeeded by a heavy fall of rain, which had the effect of refreshing and greatly reviving the plants. A second fall in the beginning of February served completely to renovate them; and when Dr. Wight relieved Captain Hughes, they were quite healthy and full of blossom and fruit. 41

Dr. Wight's letter, 3rd May 1842. Parl. Return (1847) p. 335.

Relative effects of the Monsoon, the Drought, and the Rain upon the Cotton shrub: difference between the Red and Black soils.—This great and unexpected success is thus accounted for by Dr. Wight. The sowing commenced about the middle of September. In October, whilst the plants were still young and tender, the North-east monsoon commenced, and then the plants outgrew their strength. On the 2nd of November the bright weather set in, and lasted so long, that the plants gradually sickened and drooped, until they appeared burnt up. But meantime the soft juicy wood previously formed, acquired consistence and became well matured. The second rains supplied the requisite nourishment and stimulus to renewed growth, and a new formation of flower buds. Here must be noticed a remarkable difference between the effects of the Black and Red soils respectively upon the cultivation of the plant. Before the second rain in January and February, the Cotton in the Red soil appeared to be in the most favourable condition; whilst the Cotton in the Black soil seemed to be utterly ruined. After the second rain the state of things was exactly the reverse. The plants in the Black soil were the most flourishing, whilst those in the Red soil were less productive. Dr. Wight attributed these results to the different effects of the rain upon the two soils. During the first rain 42

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the Black land caked at the surface, whilst the Red land was more open, and the water drained freely off. Here then the plant suffered from the caked surface of the Black soil, and profited by the free drainage of the Red soil. But during the drought the plants were still sustained in the Black soil, because moisture had been retained under the caking. When the second rain fell, it ran off the caked Black soil, but soaked the plants in the Red soil to an injurious extent: consequently the plants now flourished in the Black land, but drooped in the Red land. These observations are worth preserving as illustration of the nature of the Cotton plant; but we shall ultimately see that the Black soil was considered less fit than the Red for the American varieties.

43 **Results of the Season of 1841-42.**—The results of the Cotton experiment for this year may be gathered from the following tabular abstract of the extent and quantity of the produce of the Government Farms, as the matter stood on the 1st of May 1842.

Description of Soil.	Description of Cotton.	No. of Acres.	Amount of produce.	Average per Acre.	
			lbs	lbs	oz
Black Soil	New Orleans	94	15,923	169	6
	Indian	6	1,340	223	5
Red Soil	New Orleans	6	160	26	10
	Indian	10	4,143	414	4
Superintendent's Farm.					
Red Soil	New Orleans	2	125	62	8
	Indian	2	300	150	0
		120	21,991	183	4
	Deduct for wastage26 acres	94	....	True average. 233	14

Samples of the Cotton were sent home and reported on by Messrs. Tetley and Earle of Liverpool; but no judgment could be formed of the quality or value from the small samples sent. The most important feature in the report of Messrs. Tetley and Earle was, that none of the Cotton was more cut, and some not cut so much, in the process of ginning, as the average American supply.

Parl. Return (1847) p. 348,349.

Dr. Wight's plan of operations: introduction of American Culture more important than that of American Cotton.—Meantime Dr. Wight seems to have arrived at the conclusion that the improvement of the Indian and Bourbon Cottons was of greater importance than the introduction of American Cottons. Accordingly, during a tour through the Cotton growing portions of the Coimbatore district, he had entered into agreements with the Ryots. On the one hand, he was to pay their rent and part of their agricultural charges. On the other hand, they were to cultivate their own Indian and Bourbon Cottons according to the American system, and also to grow any American Cotton seed which he might give them; and at the same time they were to give him one half of the crop, and the refusal of the other half at market price. To carry these arrangements into effect, he proposed to station the three Planters at three distinct and pretty distant points, in order that they might supervise the cultivation of the rented lands. These propositions were approved by the Madras Government, and at the commencement of the second season, we shall see them in full operation.* 44

Dr. Wight's letter, 14th March 1842, Parl. Return (1847) p. 330.

Early trials of the American saw gin.—Before the close of the first season, the American saw gin, sent 45

* This plan, as regarded the extension of the American Cotton and cultivation amongst the Ryots, proved a failure. See Dr. Wight's remarks upon this point at the close of the first period of four years cultivation in Coimbatore, para. 84.

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Dr. Wight's letter, 13th June 1842. Parl. Return (1847) p. 342.

out by the Court of Directors, had arrived in Madras, and been used in Coimbatore instead of the churka, but had not turned out perfectly satisfactory. It cleaned the Cotton far more thoroughly than the churka; but notwithstanding the favorable report of Messrs. Tetley and Earle, it certainly so far injured the staple, as to render it less suitable to the Native spinning. Again the working of the gin was nearly as expensive and infinitely more laborious than that of the churka; as eight strong men turning the gin, could scarcely clean as much daily as ten or twelve feeble old women or children could clean with the churka.

Dr. Wight's Notes on American Cotton Agriculture, 17th February 1843, Parl. Return (1847) p. 350.

46 **Second Season, 1842—43: arrangement of the four Experimental Farms.**—The arrangements already indicated are carried out at the close of the first season. Mr. Hawley the Planter was transferred to the Bombay Government, but his place was filled by Mr. Henry Sherman, a European born and educated at Madras. Dr. Wight then established one farm at Coorchee, two at Coimbatore, and one at Oodoomulcottah, thus:—

		Acres.
Dr. Wight and Mr. Sherman at Coorchee, . .	About	200
Dr. Wight at Coimbatore,.	„	200
Mr. Simpson at Coimbatore.	„	330
Mr. Morris at Oodoomulcottah.	„	350

Dr. Wight's letter, to the Madras Govt. 10th Nov. 1843, Parl. Return (1847) p. 360.

47 **Three varieties of land, viz.—Black, Red and Alluvial.**—The four Farms embraced three distinct varieties of soil, viz.—

1st. Black Cotton ground.

2nd. Red land, formed from disintegrated granite, and for the most part only a thin stratum over the subjacent rock.

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3rd. Alluvial land, composed of clay and sand, which had formerly been under cultivation, but which had been lying waste for many years, probably from having attained so high a level as to render irrigation difficult.

48 **Distribution of soil amongst the four Farms: method of cultivation.**—These varieties of soil were thus distributed. Dr. Wight and Mr. Sherman's Farm at Coorchee chiefly consisted of Alluvial land; Dr. Wight's Farm at Coimbatore of Red land; whilst Mr. Simpson's Farm at Coimbatore, and Mr. Morris' Farm at Oodoomulcottah, were chiefly composed of Black Cotton land, though both included a small portion of Red land. About this time Lord Elphinstone requested Dr. Wight to draw up some Notes on the American system of agriculture. These Notes are by no means complete in themselves, but they are valuable as illustrating the stage at which the Cotton experiment had arrived. Accordingly the substance is here exhibited in a classified form; but the practical reader will do well to compare them with other results, and especially with the more matured observations of Dr. Wight and Mr. Finnie, which will be found in other paras of the present volume.*

Dr. Wight's Notes. Parl. Return (1847) p. 350.

DR. WIGHT'S NOTES ON AMERICAN COTTON CULTURE AS PRACTISED ON THE GOVERNMENT COTTON FARMS.

49 **Drill husbandry: land ploughed and cast in ridges, eight or ten inches high, at intervals of about five feet.**—The American system of Cotton agriculture is simply Drill husbandry. The ground is ploughed and cast

* For Mr. Wroughton's Remarks on the cultivation of American Cotton in India, see paras 67-74. For Dr. Wight's "Notes on the Habits of the American plant, and their adaptation to the seasons of India," see paras 92-118. For Mr. Finnie's "Notes on Cotton Cultivation in America and India," see paras 143-160. For Mr. Finnie's "Notes on the pecularities of the Cotton trade in Tinnevelly," see paras 175-178. For Dr. Wight's Final Report, see paras 263-281. As regards Bourbon Cotton, see Mr. Hughes's instructions to Mr. Heath, para 34, *note.*

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Compare Royle's Cotton Culture, p. 217 219.

into ridges, about four, five, or six feet apart, and about eight or ten inches high. The distance between these ridges must be regulated by the richness or poverty of the soil, and by the variety of the Cotton grown. The object is to keep the plants sufficiently near to each other, that when full grown the branches may meet and cross in the intervals between the ridges, and thus protect the soil from the heat and drying influence of the sun. Accordingly in rich soils the New Orleans Cotton plants may be five feet apart, but in the poorer soils they must be nearer to each other; as the branches naturally will not be so luxuriant on a poor soil as on a rich one. Then again the ridges for Sea Island Cotton may be seven feet apart. The primary object of these ridges is to draw off the superfluous moisture, by means of the water furrow between them; a precaution which is especially necessary in America, where the frequent and heavy rains of spring and summer are especially injurious to the young plant.

50 **Sowing in a furrow of about two inches deep along the centre of each ridge.**—In the Farms at Coimbatore the seed is sown thus. A slight furrow, from an inch and a half to two inches deep, is run along the centre of the ridge with a country plough. The seed is then pretty thickly scattered in the furrow, and covered in by running over it a small triangular drill harrow.

51 **Scraping out of superfluous plants and weeds.**—When the plant is three or four inches high, and beginning to put forth a third or fourth leaf, it is thinned or "scraped;" that is, the greater part of the superfluous plants, together with the weeds, are scraped out with the hoe. About ten or twelve days afterwards this scraping operation is repeated, to complete the thinning and superficial cleaning of the land. With regard to this hoeing, Dr. Wight remarked that the American plan of scraping was decidedly inferior to that

which he had adopted, viz.—that of freely loosening the surface and digging out the weeds. Had he not gathered up the grass roots as fast as they were dug up with the hoe, they would have subsequently grown all the faster. This defect in the American system was, however, amply compensated for by liberal ploughing between the rows.

Banking up the ridges, first with the plough and 52
afterwards with the hoe.—When the hoeing has been completed, or a few days later, the plant is sufficiently advanced to admit of the plough being used between the rows. The plough employed is small and light, such as can be drawn by a single bullock; with it a light furrow is run within five or six inches of the plants, turning the earth inwards towards the roots to supply the place of that previously removed by scraping. This operation of banking up the roots is completed with the hoe. If the soil is foul, and at the same time soft enough to be easily worked, the ploughing may be repeated several times, the more effectually to destroy the weeds.

Keeping down extraneous vegetation until the 53
crop ripens.—By the time these various operations are completed, the plant is between two and three months old, and in good soils should be between two and three feet in height. The agricultural operations are then drawing to a close; subsequent proceedings being mainly confined to keeping down extraneous vegetation until the crop begins to ripen. The period that elapses from the fall of the flower until the bursting of the pod, is from six to eight weeks. The sooner the Cotton is picked after the pod bursts the better. This system, pursued at Coimbatore, was of course a very costly one, as compared with the simple and indolent practice pursued by the Natives.

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54 **Native ploughs and American ploughs compared: question of whether American Cotton would thrive without ridging.**—On ploughing and ridging, Dr. Wight remarked that the Native ploughing was much less perfect than the American ploughing, unless the land was gone over several times. Again, the Native plough was not adapted to ridging, and Mr. Morris considered that the American plant would never thrive unless the land was ridged. Dr. Wight, however, did not coincide in this opinion; and tried the experiment of doing without ridging, the results of which will be found at para 62. The subject deserved attention on account of the great difference of expense. The Native plough complete only costs about twelve annas, or one shilling and sixpence; and the small country cattle, which would suffice to work it, could be purchased at from ten rupees to fifteen rupees, or 20*s.* to 30*s.*, per pair. On the other hand, the heavy American plough, and the stronger cattle required to draw it, would cost for the whole turn out, including harness, from seventy to eighty rupees. Thus the Native plough and cattle might be purchased for about twenty or thirty shillings, whilst the American turn out would cost from seven to eight pounds.

Dr. Wight's letter, 10th Nov. 1843. Parl. Return (1817) p. 360.

55 **Results of the second Season on the Black, Red, and Alluvial soils, 1842-43.**—To return to the main narrative. The principal sowing for the second season had taken place in August and early in September; but a small portion was sown as early as July, and some as late as October. The season proved unfavourable, in consequence of a heavy fall of rain in April, in the height of the gathering season. Prior to this storm the appearance of the plant on the different soils was as follows. On the Black lands it was generally small. On the Red land it was large and very healthy where the soil retained moisture, but small where the soil was thin and dried

quickly. On the Alluvial lands the plants grew luxuriantly where the soil was high and drainage sufficient, but did not thrive where the soil was low and retentive of moisture. In April the weather became stormy, and a series of rains commenced which lasted a week. These storms not only destroyed the Cotton ready for picking, but also the crop which was maturing. Indeed within a week or ten days after the rains, whole fields were covered with blackened and half opened bolls, with their contents agglutinated into a dark brownish decayed mass. The plants however continued healthy, and began to produce a good crop of flowers. They were therefore permitted to remain a few months longer, by which means a second crop was obtained from the Red lands.

Comparison of the growth of the Indian, New Orleans, and Bourbon Cotton.—The Indian Cotton plant, according to Dr. Wight, is of slower growth than the American, and takes a deeper root. Consequently, this species is not so much affected by the heat and drought, until the soil becomes so far cracked as to allow of evaporation from the deeper strata, and thus serves to exhaust the stores of nourishment on which the plant had previously subsisted. The Indian Cotton therefore thrives well on the Black lands, which possess a wet or tenacious sub soil, but which at the same time readily throws off its surface moisture. The American Cotton, not penetrating so deeply into the soil, thrives best on the low lying portions of the Red land, towards which the moisture of the upper ones is drawn; and again it thrives well in the Alluvial soils, which from their position are naturally loaded with moisture.* The Bourbon again takes very deep root, and bears the climate even better than the Indian plant. 56

* This opinion was subsequently modified. The excessive moisture was found to stimulate the growth of the stem, branches, and leaves, at the expense of the flowers, fruit, and seed. See para 94.

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Reports of English Brokers on Dr. Wight's Cotton.—The proceedings of Dr. Wight received the approval
57 of the Court of Directors. About 200 bales of Cotton grown this year were sent home, and after a careful examination of the packages the following opinions were expressed by the Brokers.

General letter from the Court of Directors, 2nd Oct. 1844, Parl. Return (1847) P. 370.

58 **Oopum (Indian) Cotton.**—The staple (about 62 bales) considered to be very short and wild, but beautifully clean and white. No difference was discovered in the quality of this Cotton, whether produced on the Black, Red or Alluvial soil.

59 **New Orleans.**—The staple (about 144 bales) was pronounced much better than the Oopum, being longer and finer, less cut with the gin, the greater part clean and of good colour, but not so white as the Oopum. Some variations were found in the New Orleans with reference to the soil in which it was produced; that from the Black soil having the preference, the Red next, and the Alluvial the last. This Cotton averaged the usual price of the New Orleans in bond.

60 **Bourbon.**—The staple (about 6 bales) was found much superior to either of the other, being longer and finer. Being, however, partially injured in cleaning, and containing many white specks or knitters, a mixture which is considered very objectionable, the sale prices did not exceed those of the New Orleans.

61 **Third Season, 1843-44: state of the Cotton Farms, Gins, and Gin-house.**—The results of the third season of the Cotton experiment at Coimbatore were naturally expected to turn out better than those of any former years. The Farms were in a better state of preparation, and Dr. Wight and the Planters were in a position to profit by the experience of two seasons; and moreover they had more or less manured their land by ploughing in the old stalks. The saw gins sent out had required alterations and addi-

Dr. Wight's letter, 3rd May 1842. Parl. Return (1847) p. 338. Despatch from Court of Directors 29th July 1842. Ibid p. 339. Despatch of Madras Government, 9th July 1842. Ibid p. 341.

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tions, but they were now placed in good working order under the direction of Mr. Petrie, an Engineer who had been sent out from England expressly to work the gins and to superintend the repair of the machinery. A Colaba press had also been forwarded in the place of an Atlas press, which had not been found to work so well as had been expected.

Dr Wight's letter, 10th November 1843. Ibid p. 363. Despatch from the MadrasGovernment, 6th June 1843. Ibid p. 359.

Unfavorable results: their causes.—The results however of this season were unfavorable, both as regarded the crop and the proportion of wool to seed. Dr. Wight ascribed the failure to two causes:—1st, To the circumstance that the abundance of rain brought by the North East monsoon had fallen within too short a period, and had been followed by a long period of dry weather; and 2nd, To the American system of ridging, which created a deep water furrow on each side of the row of plants, and thus in dry seasons drained the water too rapidly off the lands. This latter idea had already been made the subject of experiment. At an early period Dr. Wight had not considered that American ridging was suitable to an Indian climate. Accordingly during the second year he had tried the effect of sowing on level ground; but then the season had been unusually wet, and the ridging would have served to carry off the water. In the third year he had reverted to the ridging; but then the season had turned out unusually dry, and the ridging drained the land too rapidly, and in fact proved worse than the level method. The real cause of the failure appears to have been the exhaustion of the soil, and the necessity for a rotation of crops. However this subject will be discussed further on. 62

Dr.Wight's letter, 13th November 1844. Ibid p. 371.

See para. 54.

Comparison of the crops of the third Season with those of the second.—The difference in the out-turn of the second and third seasons, as regarded the proportion of Cotton produced to the extent of acreage, may be thus exhibited. 63

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	2nd Season, 1842-43.	*3rd Season*, 1843-44.
Acreage	$910\frac{1}{4}$ acres	1,090 acres.
Seed produced	207,632 lbs.	177,126 lbs.
Average per acre	228 lbs.	$162\frac{1}{2}$ lbs.

The proportion of wool obtained from the season in the two different years is shown in the following table, which exhibits the proportion of wool obtained from 100 lbs. of Cotton seed.

	2nd Season.	*3rd Season.*
New Orleans	$29\frac{1}{2}$ lbs.	$27\frac{3}{8}$ lbs.
Bourbon	26 "	$26\frac{1}{8}$ "
Oopum (Indian)	$22\frac{3}{4}$ "	$23\frac{1}{4}$ "

64 **Fourth Season, 1844-45: experiment of treating the plant as a biennial.**—Hitherto Dr. Wight had treated the Cotton plant as an annual; that is, he had annually rooted out the old plants of the preceding year, and then resown the ground. He found however that the Bourbon variety was constantly treated as a biennial in India,* as was also the Sea Island in Egypt. Accordingly he proposed to try the experiment with New Orleans Cotton, of pruning the plants nearly down to the ground, and leaving the roots to yield a crop of fresh wood for the second year. By this method, he believed that during the second year the roots would penetrate much deeper into the ground than they did the first. The roots would thus pass into an unexhausted soil, and would therefore be better nourished; whilst a considerable saving would be effected in the expenses of cultivation during the second year. This experiment however, ultimately turned out a failure. This fourth season is chiefly remarkable for having produced a much larger and finer seed, which again produced from three to three and a half per cent. more of Cotton wool.

Para. 117.

Dr. Wight's letter, 16th Feb. 1846 Parl. Return (1847) p. 402.

* See foot note to para. 34.

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65

Comparative produce of the four Seasons.—The average produce per acre of the four successive crops of Cotton, obtained during the four years 1842, 1843, 1844, and 1845, is exhibited in the following table. It must however be borne in mind that the crops included all kinds of Cotton,—Native, Bourbon and New Orleans ; and that the figures represent the number of pounds of seed Cotton which were obtained per acre.

Dr. Wight's Remarks on Cotton Cultivation in India, 1st Sept. 1845. Parl. Return (1847) p. 391.

Farms.	1841-42 — Average per acre.	1842-43 — Average per acre.	1843-44 — Average per acre.	1844-45 — Average per acre.	Cotton grown.
1. Superintendent's Farm, Coimbatore	....	140⅛	125⅛	105¾	1. Principally American and Bourbon ; soil for the most part very poor and generally shallow and unsuitable.
2. Mr. Simpson's Farm, Coimbatore.	233	200⅝	72⅝	....	2. Principally American and some Indian (Oopum) ; soil generally Black, but of very inferior quality.
3. Mr. Morris' Farm, Coorchee.*	....	307½	199½	136⅛	3. Principally American, some Bourbon and Oopum ; soil Alluvial but poor, being apparently exhausted by the first very luxuriant crop.
4. Mr. Sherman's Farm, Oodoomulcottah.	....	270¾	234	229	4. First and second seasons, principally American ; third season mostly Oopum, which accounts for the high average outturn of the third crop ; soil Black, and generally of the best quality of that sort of land.

* In consequence of bad health on the part of Mr. Morris at the latter

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66 **General result of the four Seasons of the experimental Farms: necessity for a rotation of crops.**—The four successive seasons of experiments fully established the necessity for a methodical rotation of crops. The first year the Farm at Coimbatore produced a larger crop than the second, notwithstanding a great proportion was destroyed by the stormy weather. Again, the second season produced a larger crop than the third, though the ground had not been so well prepared. This conclusion was further strengthened by an experiment made by Mr. Wroughton the Collector at Coimbatore. At the commencement of the fourth season Mr. Wroughton had selected a field at Ootacamund, which possessed no peculiarity of soil, but which had not been cultivated for many years. This field was ploughed by the Natives in the Native fashion, but sown and cultivated according to the American method. The situation derived but little advantage from the climate, for though it participated in the benefits of both the South-west and North-east monsoons, yet during that season both monsoons were unusually light. The result, however, was a crop averaging nearly 1,100 lbs. per acre, of which the greater part proved to be of excellent quality. This extraordinary out-turn far exceeded any thing which Dr. Wight and his Planters had been able to obtain, with all their labour and pains in cultivation. Accordingly Dr. Wight determined on removing his Farms and cultivating fresh soil.

67 **Causes of the success of Mr. Wroughton's Cotton experiment.**—Before proceeding further, it may be as well to remark that, in the latter part of 1842, Lord Elphinstone had been succeeded by the Marquis of Tweeddale, as Go-

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part of the second season 1842-43, he exchanged Farms with Mr. Sherman. Thus Mr. Morris became located at Coorchee, and Mr. Sherman at Oodoomulcottah.

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vernor of the Madras Presidency. The Marquis of Tweeddale is well known as a practical agriculturist, and naturally took a deep personal interest in the cultivation of Cotton in this Presidency. Accordingly, the Madras Government at once called upon Mr. Wroughton, to explain the circumstances which led him to select the particular lands; as well as the cost and method of his culture, with any particulars which would serve to illustrate the causes of his success. Mr. Wroughton ascribed his success generally to two conditions, which he considered to be absolutely essential in the cultivation of American Cotton; namely, the influence of the two monsoons, and the effect of an earlier sowing than is practised by the Natives.

Minutes of Consultation, 2nd April 1846. Parl. Return (1847) p. 407.

Mr. Wroughton's letter and memorandum. 9th June 1846. Parl. Return (1847) p. 409.

1st, Influence of both monsoons.—The peculiar influence of both monsoons has already been described; as well as the physical formation of the Western Ghauts, through which the South-west monsoon rushes at intervals, and thus affords certain tracts of country the benefit of both monsoons. This is the case at Courtallum in Tinnevelly; it is also the case over a very large tract of country at the Paulghautcherry Pass in the district of Coimbatore ; and it appears also to be the case in the neighbourhood of Ootacamund. In this particular Mr. Wroughton enjoyed an advantage over Dr. Wight. The Farms of Coimbatore were shut out from the South-west rains by ranges of hills which attracted the clouds. Mr. Wroughton however chose the neighbourhood of Ootacamund, where the country enjoyed the benefit of both monsoons. Here he selected an inferior land on purpose; inasmuch as waste lands of the same quality prevail to an extent out of all proportion to the better and more expensive kinds, and he was naturally anxious to ascertain if a profitable return could be secured from such a soil; and, as we have already seen, the out-turn which followed, exceeded his most sanguine expectations. 68

See para. 7.

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69 **2nd. Early preparation and sowing.**—As regarded season, Mr. Wroughton remarked that the Native mode of culture was defective. The Ryots invariably sowed their lands in October, and consequently the tender plants were withered by the North-east winds, and yielded only a stunted shrub and scanty produce. He, on the other hand, ploughed his land in March and April, and then left it fallow until the end of July, when advantage was taken of any South-west rain that might fall, to run the plough lightly over the land once more, and then to commence sowing. The sowing, however, should not take place before the end of July. Then the seed germinates, and the plant struggles against the South-west rains, gaining root without vegetating too much. Care, however, should be taken not to be too late, as too much rain would prove as prejudicial as too little. Meantime the process of weeding and thinning ought to be carried on intermediately, and be repeated occasionally. By this mode the plants will acquire so great a degree of hardiness, as to be prepared for any change; and the showers previous to the North-east monsoon, and the rains which fell during its continuance, will produce a good sized plant about three feet high, and yielding from 200 to 250 bolls.

70 **Drought and Grate the only dangers to be avoided.**—The only evils which Mr. Wroughton had found occasion to dread were the drought and grate. If the grate entered the boll without being observed, it gradually consumed the seed; but this evil could be avoided by sufficient vigilance. The insect never attacks the boll until the seed is ripe. Consequently, if its entrance be observed, the boll may be at once pulled off and dried in the sun. Then the grate dies immediately, whilst the bolls progress nearly as well on the ground as on the tree.

Question of manure.—As regarded manure, Mr. Wroughton had discovered that it should not be applied to land in the same year that Cotton was cultivated upon it. In fact, 71
he was very doubtful whether manure was required at all, as deep ploughing often repeated seemed to effect all that was needful.

Three advantages possessed by India over America in the cultivation of American Cotton.—Mr. 72
Wroughton further remarked that three advantages were possessed by his district over America in the cultivation of American Cotton; viz—1st, There were fewer contingencies to guard against; 2ndly, The soil was more congenial; and, 3rdly, Labourwas much cheaper. On the first point he stated, that whilst the Indian cultivator had only two evils to dread, the drought and the grate, the American cultivator had six contingencies to guard against; namely, the rot, the rust, the caterpillar, the frost, and storms of wind and rain. On the second point he stated, that his land at Ootacamund had yielded nearly 1,200 lbs. of seed Cotton per acre, which would give 350 lbs. of clean Cotton wool; whilst the average crop of the best soils in America was only 400 lbs. of clean Cotton wool per acre. But even granting that the productive power of the American soil was superior, still the cheapness of labour in India would enable the cultivator to produce much cheaper Cotton. In India the cultivation was peculiarly a family undertaking; little children plucking the Cotton, after a little practice, as well as the women.

Remunerative demand alone required in India.— 73
Mr. Wroughton summed up his remarks by stating, that nothing was now required in India, but a remunerative demand to stimulate the Ryots to the growth of Cotton. For many years the cultivation had been exceedingly neglected. Rarely had any attempt been made to produce it as a single crop. In most cases the seed was sown with three or four

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other kinds of grain, and where it was sown alone, the land was insufficiently prepared. Indeed the successful and profitable culture of Cotton required the investment of more capital and harder labour than was encouraged by local circumstances and existing prices.

74 **Cost of cultivation.**—As regarded the cost of cultivation, Mr. Wroughton exhibited the following tables, exhibiting the amount of charges incurred at Ootacamund on twenty two cawnies, or about thirty acres of land; from which it will be seen that more than 25,000 lbs. of seed Cotton, producing nearly 7000 lbs. of wool, were obtained at a cost of £32.

Memorandum of charges incurred for the cultivation of Cotton at Ootacamund, from 1st July 1844 to 30th June 1845.

	£.	s.	d.
Assessment of about thirty acres of cowle lands	2	8	5½
Charges for ploughing lands	2	8	0
do. for weeding	2	5	4½
do. for gathering produce	7	12	8¼
do. for taking out uncleaned Cotton at Coimbatore	5	16	6¾
Ginning and packing	2	19	11½
Value of gunny bags purchased for Cotton bales, &c.	4	3	8
Value of ropes for Cotton bales, &c.	0	15	9
Hire for sewing gunny bags	0	8	7½
do. for conveying Cotton on carts	1	12	6
Pay of a cooly	1	4	3
Value of bamboo mats	0	3	0
do. of a large bamboo basket	0	2	0
Total. .	£32	0	10

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Memorandum, showing the quantity of Cotton staple and seed produced in the field near Ootacamund from 18th July 1844 to 30th June 1845.

	Bales.	lbs.
Cotton wool, 1st Sort - - -	17	4,250
„ 2nd „ - - -	5	1,250
„ 3rd „ - - -	5½	1,375
Total......	27½	6,875

Aggregate produce seed Cotton in lbs. 25,450

Further proceedings of the Fourth Season, 1844-45.—Two other events fall into the history of the fourth season. In the first place, Mr. Simpson, one of the Planters, reported on the capabilities of the district of North Canara for the production of American Cotton. Secondly, Dr. Wight, in reply to some queries furnished this year by the Marquis of Tweeddale, entered more at detail into the character and prospects of the Cotton experiments in Coimbatore. These circumstances will be considered in order. 75

Mr. Simpson's report on the districts of North Canara, bordering on Dharwar.—In July 1844 Mr. Simpson was directed to proceed to Sirsee in North Canara on the western side of the Madras Presidency, for the purpose of reporting on the suitability of the soil and climate in the Soondah and Soopah talooks for the cultivation of New Orleans Cotton. These talooks bordered on the Cotton growing district of Dharwar in the Bombay Presidency, where New Orleans Cotton appears to have been cultivated with considerable success. Accordingly, Dr. Wight considered that these localities on the very borders of Dharwar would prove equally well adapted for the American variety. 76

Mr. Simpson's letter, 30th Sept. 1844. Parl. Return (1847) p. 378.

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77 **Soondah : unfavorable from the presence of "Kunkur."**—Mr. Simpson considered that the soil of Soondah was on the whole unfavourable ; there being in its composition too much disentegrated laterite rock, called by the Natives "Kunkur." Some lands, however, were free from this objection, and might yield remunerative crops.

78 **Soopah : soil favorable but climate unfavorable.**—In the Soopah talook, Mr. Simpson thought that some of the land about Mundgood and Hullial was favourable to the growth of Cotton ; but such lands, he said, could not be easily obtained ; and the few that were available were covered with such immense tufts of grass, that they could not be easily prepared. Moreover the climate during the period of culture, viz., from August to the end of March, was not favourable, as a cold wind prevailed which would probably prove injurious to young plants. A climate to suit Cotton ought, in his opinion, to be quiet, moist, and moderately warm. Again, the labouring people in the district were chiefly emigrants, who came up from the country on special contracts and then returned home. Altogether he doubted whether Cotton would grow in Soopah. The talook, it was true, bordered on the Cotton growing district of Dharwar, yet it differed both in climate and soil ; and that part of the Dharwar district which adjoined the Soopah and Soondah talooks for some miles inward, was not under Cotton culture, as the Natives considered that the soil partook too much of the nature of the Soondah country.

79 **Mr. Simpson's opinion on the failure of the Coimbatore Farms to extend the culture of American Cotton.**—Mr. Simpson next discussed the general question. Assuming that the ulterior object of the experiment was to introduce the American seed and machinery amongst the Ryots, he considered that operations should be commenced in some of the known Cotton growing districts in the Ma-

dras Presidency, rather than in unknown soils like those of Canara. Again, he considered that whilst the American system and general management of the Coimbatore Farms might test the fitness or unfitness of the soil and climate of that region, yet they would never induce the Natives to adopt the same system of culture. Indeed the Ryots seemed frightened at the immense establishment at Coimbatore. They never would regard the Planters as cultivators like themselves; but rather looked upon the experiment as some public work undertaken by the Sirkar, which they could not understand, and in which they had no concern.

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Recommended the appointment of a practical person to distribute seed and exhibit the gins.—Accordingly Mr. Simpson proposed the appointment of some practical person to distribute American Cotton seed amongst the Ryots, and to exhibit the working of small sized saw gins, and dispose of them as opportunities arose. He quoted the success of Mr. Mercer, a Planter located in Dharwar, who had already disposed of six saw gins to the Natives in the Southern Mahratta country. He urged that the cost of such an establishment would be trifling in comparison with the sums expended on the experimental Farms at Coimbatore. Finally, he recommended the Bellary district, in the neighbourhood of Hurryhur, as the best locality for commencing the operations he had indicated. 80

Approval of Mr. Simpson's suggestions: his transfer to the Bombay Presidency.—The Marquis of Tweeddale seems to have entirely approved of the suggestions of Mr. Simpson, and so also did the Court of Directors. Circumstances, however, appear to have interfered with his being located in Bellary, and his services were transferred to the Government of Bombay. 81

Minutes of Consultation, 14th December 1844. Parl. Return (1847) p. 382. Dispatch from Court of Directors, 8th Oct. 1845. Ibid p. 384.

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82 **Dr. Wight's answers to the queries of the Marquis of Tweeddale.**—In September 1845, the Marquis of Tweeddale submitted several queries to Dr. Wight respecting the cost of the Cotton experiment at Coimbatore, the superiority of the American to the Native Cotton, the extension of the improved methods of cultivation among the Ryots, and the adoption of the saw gins by the Natives. The return of expenditure was so very imperfect that it need not be produced here. On the three other points, however, Dr. Wight supplied the following information.

Dr. Wight's letter, 29th September 1845. Parl. Return (1847) p. 387.

83 **Superiority of the American Cotton to the Indian.** —As regards the superiority of American Cotton to the Indian, Dr. Wight reported that the American was about 20 per cent. more valuable than the Indian, or nearly as 5d. is to 3¾d. Again, the American seed produced from 7½ to 9 per cent. more Cotton wool than the Indian seed ; in other words, 100lbs. of American seed yielded from 28½lbs, to 30lbs. of clean Cotton wool, whilst 100lbs. of Indian seed only yielded about 21lbs. of clean Cotton wool.

84 **Extension of the improved methods of cultivation among the Ryots.**—Upon this point Dr. Wight's report was not satisfactory. He had introduced the American mode of cultivating and cleaning, to the extent of having invariably carried it out himself. Very few of the Natives, however, had followed his example. He had offered them American seed to any extent; he had invited them to cultivate for him; he had even engaged to purchase the produce of the foreign seed until its market price could be ascertained.* But still the Natives hung back from adopting either

* The price offered by Dr. Wight for American Cotton appears to have been first 20 Rupees (or £2) and afterwards 15 Rupees (or 30*s.*) per candy (500 lbs.) for clean and well picked seed Cotton ; the ordinary price of Indian seed Cotton as it comes from the field averaging about 12 Rupees (or 24*s.*) per candy. Dr. Wight however argued that Government would be a

the American seed or the American culture. A few Ryots promised to cultivate to a small extent, but none seemed anxious to commence. Even the Ryots who cultivated Mr. Wroughton's field,—which yielded a clear profit of 700 rupees, after deducting a liberal sum for agricultural charges and ginning,—all held back from cultivating the foreign seed for themselves; apparently on the supposition that the profitable result in that case was merely owing to extreme good luck, and that they had no hope of being equally fortunate.

Reluctance of the Ryots to adopt the saw gin.—As 85
regarded ginning, equal facilities had been held out to the Ryots. They had been invited to examine the whole process, and had been asked to compare the Cotton cleaned by the gin with that cleaned by the churka. Moreover, the economy of the gin as compared with that of the churka had been pointed out. But still there were obstacles, and weighty ones, against the adoption of the gins by the Natives. It involved the necessity of bringing from distant villages to the gin house nearly three bullock loads of heavy seed Cotton to be ginned, in the place of one bullock load of light wool. Again, the Natives urged that they lost two per cent. more by the gin than they did by the churka; in other words, that two per cent. of the impurities, which remained in the churkaed Cotton, were removed by the gin. Unless, therefore, higher prices were realized for ginned Cotton than for churkaed Cotton, the Native cultivators would be positive losers by the improved method of cleaning.

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gainer rather than a loser by their purchases; for not only would the New Orleans Cotton fetch a higher price in England, but one candy of wool could be obtained from 3½ candies of seed, whilst 4¾ candies of Native seed were required to produce one candy of wool when cleaned by the gin. Compare Dr. Wight's letter, 13th November 1844. Parliamentary Return (1847) p. 371, with despatch from the Court of Directors, 8th October 1845, Ib. p. 384. See also Dr. Wight's letter, 1st September 1845, Parliamentary Return (1847) p. 392.

CHAPTER III.

FOUR YEARS OF EXPERIMENTAL CULTURE UNDER DR. WIGHT IN COIMBATORE.

1845 TO 1849.

(86.) Position of the Cotton experiment in 1845. (87.) New arrangements. (88.) Mr. Morris reports unfavourably of Bellary: his death. (89.) Mr. Finnie reports unfavorably of the Madras district: dispatched to Tinnevelly. (90.) Dr. Wight's new Cotton Farms in Coimbatore 1845: four points neglected in the previous experiments. (91.) Results of four successive seasons on the new Farm, 1845-49. (92.) Suggestions of the Manchester Association respecting sowing in May and on low soils. (93.) Dr. Wight's reply: First, July is the best time for sowing. (94.) Second, Low Alluvial soils have proved a failure, but low lands near the coast are under trial.

DR. WIGHT'S NOTES ON THE ADAPTATION OF THE AMERICAN PLANT TO THE SEASONS OF INDIA.

(95.) Habits of the American plant. (96.) Four Seasons of the American plant. (97.) Adaptation of the habits of the American plant to the Indian seasons. (98.) First, Seasons on the Eastern side, under the North East monsoon. (99.) Monthly mean temperature and mean falls of rain in the Carnatic. (100.) Cotton cultivation under the North East monsoon: sowing in September. (101.) Second, Seasons on the Western side, under the South-West monsoon. (102.) Cotton cultivation under the South West monsoon: sowing in May. (103.) Third, Intermediate regions under both the North East and South West monsoons. (104.) Cotton cultivation under both monsoons: sowing in July. (105.) Large experiment in early sowing throughout the Cotton districts in the Madras Presidency. (106.) First Result: India not too hot but too cold. (107.) Theory confirmed by a comparison of the temperature of Madras with that of Vera Cruz, Mobile and Natchez. (108.) Rising temperature in America, but diminishing temperature in India, during the growing seasons. (109.) Second Result: Carnatic not too dry, confirmed by a comparison of mean falls of rain. (110.) Two methods of cultivating American Cotton in India: adaptation of seasons and artificial irrigation. (111.) Experiments in irrigation, securing a rising temperature

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to the growing plant. (112.) Five practical suggestions. (113.) First, Choice of soil. (114.) Second, Preparation of the land for the seed. (115.) Third, Ploughing and hoeing during the growing season. (116.) Fourth, Distance between the Rows. (117.) Fifth, Treatment of the plant as an Annual, and rotation of crops. (118) Profitable cultivation of American Cotton throughout the Peninsula.

(119.) Plans for extending the American Cotton culture amongst the Ryots, 1845-49. (120.) Court of Directors order 6,000 bales of East Indian Cotton, 1845. (121.) Proposition for reducing the Assessment of lands under American Cotton cultivation. (122.) Marquis of Tweeddale in favour of the remission. (123.) Court of Directors decide against the remission. (124.) Failure of the purchase system as regarded American Cotton. (125.) Contemplated establishment of a number of small Farms.

CHAPTER III.

FOUR YEARS OF EXPERIMENTAL CULTURE UNDER DR. WIGHT AT COIMBATORE.

1845 TO 1849.

Position of the Cotton experiment in 1845.—Five years had now elapsed since the American planters had first landed at Madras, and commenced their operations in Tinnevelly under the superintendence of Captain Hughes. Of this period four seasons of experimental Cotton Culture had been carried on at Coimbatore, entirely under the superintendence of Dr. Wight, with the exception of a few months at the commencement of the first season. The results, as regard the fitness of the soil and climate of Coimbatore for the cultivation of American Cotton, have been duly set forth in the preceding Chapter. No progress however, worthy of the name, had been made in extending the American Culture and American machinery amongst the Natives. This subject led to much discussion. The Marquis of Tweeddale's Government proposed the abandonment of the Cotton Farms at Coimbatore altogether; and suggested that operations, like those suggested by Mr. Simpson, should be carried on by the Planters themselves; as practical men, capable of gaining the confidence of the Natives, and of placing before them in the clearest light the superiority of American Cotton, and the improved methods of cultivating the plant and cleaning the wool. Ultimately it was decided that both plans should be carried out; that Dr. Wight should continue his experimental Farming operations in Coimbatore, whilst the Planters should carry on independent operations in Bellary and Tinnevelly. 86

Minute by the Marquis of Tweeddale, 21st Oct. 1845. Parl. Return (1847) p. 394.

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87 **New arrangements.**—The necessity for a rotation of crops having been fully proved, Dr. Wight found it necessary to remove his Farms in Coimbatore to new soil. Before however noticing his operations, it is advisable to glance at the proceedings of the Planters. Mr. Simpson had been transferred to the Bombay Government, but his place was supplied by another American Planter named Finnie, who had been previously employed by the Bengal Government. Accordingly, Mr. Morris was dispatched northwards to report upon the district of Bellary; and Mr. Finnie was dispatched eastwards to report upon the district of Madras.

Revenue letter from Fort St. George, 8th Dec. 1845. Dr. Wight's letter 23rd Sept. 1845. Parl. Return (1847) p. 384.

88 **Mr. Morris reports unfavourably of Bellary: his death.**—Mr. Morris reached Bellary in October 1845, and examined the Cotton lands in the neighbourhood of the town of Bellary, and those in the talook of Adonie, about forty-three miles eastward of Bellary. He reported that the soil was Black, and therefore unsuited to the growth of American Cotton, which had thrived best on the Red lands. Again the New Orleans Cotton requires a sea breeze, but there was no sea breeze in Bellary. He next proceeded to the Cotton growing district of Dharwar in the Bombay Presidency, and there he found that the soil and climate were far better adapted to the growth of American Cotton, than the climate and soil of Bellary. Mr. Morris however remarked that the Indian Cotton grown in Bellary was superior to the same Cotton in Dharwar. He therefore proposed that a saw gin should be erected in Bellary. The suggestion was approved by the Madras Government, but not carried out. Mr. Morris died at Bellary on the 18th March 1846.

Mr. Morris's letter, 27th Nov. and 24th Dec. 1845. Parl. Return (1847) p. 413, 414.

89 **Mr. Finnie reports unfavorably of the Madras district: dispatched to Tinnevelly.**—Meantime Mr. Finnie had been dispatched to the Eastern Coast, to Pullicarny in the Madras district. His report was unfavourable. He had gone over Pullicarny with Mr. Maltby the Collector, and

Mr. Finnie's letter 6th Oct. 1845. Parl. Return (1847) p. 393.

found that all the high land was a barren waste, and that all the low land was under water. Accordingly Mr. Finnie was directed to proceed to the district of Tinnevelly in the South, and to carry out operations there. Here it will be advisable to leave him, and return to Dr. Wight at Coimbatore. Indeed, the story of the proceedings of the next four years, that is from 1845 to 1849, naturally divides itself into two parts; and therefore the present chapter will comprise a narrative of Dr. Wight's operations in Coimbatore, whilst the succeeding chapter will contain a similar narrative of Mr. Finnie's proceedings in Tinnevelly.

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Dr. Wight's New Cotton Farms in Coimbatore, 1845: four points neglected in the previous experiments.—During the four years that Dr. Wight and the American Planters had been carrying on the experimental culture at Coimbatore, four points had been neglected, which however were now duly apprehended: viz.— 90

Dr. Wight's letter, 26th Jan. 1849. Parl. Return (1857) p. 185.

1st. The necessity for a rotation of crops.

2nd. The fertilizing effect of repeated ploughing prior to sowing.

3rd. The influence of both monsoons.

4th. The superiority of Brown Sandy Loams (Red lands) for American Cotton.

As regards the first and second points, the Native method of cultivation had been superior to that pursued by Dr. Wight. The Natives never drew two consecutive crops of Cotton from the same land; and therefore were enabled to commence ploughing with the May rains, a process which they termed cooling the ground; and thus they succeeded in getting their lands into a good condition before the commencement of the sowing season in October. Dr. Wight, on the other hand, had been cultivating the same lands every

CHAP III. year; and consequently his picking season was going on, when he ought to have been ploughing; and thus he was deprived of the benefit of the best part of the rains, and compelled to sow in what the Natives called "hot" ground. As regarded the third point, his Farms had been shut out from the South-west monsoon by ranges of hills; and accordingly had no rain from May till October. Again, his Farms had been situated at such a distance from the East Coast that the North-east rains were short and scanty, and the North-east monsoon was cold and dry, being unmoistened by the sea. As regards the fourth point, Dr. Wight had now discovered that the Sandy Brown Loams, generally included under the head of Red land, were better adapted to the growth of American land, than the ordinary Black Cotton soil. He had never obtained more than 300 lbs. of seed Cotton per acre from the Black lands, whilst he had repeatedly obtained 500 lbs. and once 1000 lbs. from the Sandy Brown Loams; and indeed it was from this latter soil that Mr. Wroughton had once obtained 1100 lbs. per acre.

91 **Results of four successive seasons on a new Farm, 1845-49.**—Under the circumstances mentioned above, Dr. Wight removed to a locality, about ten miles to the South of his old Farm, and to a spot which was out of the influence of the hills, and consequently open to the South-west monsoon. The results of the four seasons may be stated in a few words. During 1845-46, one field which he ploughed in May, and which consequently was well prepared for sowing in July, produced a crop of nearly 1000 lbs. per acre. Other fields of inferior quality produced crops of 500 lbs. per acre. Other fields however, which could not be ploughed before September, and which were sowed immediately after ploughing, failed to produce a good crop. The second season (1846-47) was a failure in consequence of the failure of both

monsoons. The South-west monsoon did not commence before June, and then the showers were of very short duration; whilst from June until February not a drop of rain fell. In a word the whole country was burnt up, and the total fall of rain, during the year 1846 only amounted to six inches and a half, instead of the usual average of from twenty six to thirty inches. The result was of course, a very short crop. The third season (1847-48) proved a partial failure in consequence of extreme wet. The South-west monsoon commenced in April with copious showers. The land was thus ploughed early, the seed was sown at the end of June and beginning of July, and up to the middle of October the crops were unusually fine. Then the North-east monsoon, which had proved a failure the preceding year, brought a rain which never ceased for three days together, until nearly the end of December. Accordingly much of the large crop was altogether lost, and much of that which was harvested was much injured. Of the fourth season (1848-49) Dr. Wight merely remarks, that the crop was small. Circumstances which will be recorded in the fifth chapter, led to his temporary withdrawal in 1849. The more particular results worked out during the four years will now be exhibited in the following paragraphs.

Suggestions of the Manchester Association respecting sowing in May and on low soils.—In 1847, the Manchester Association congratulated Dr. Wight upon the success which he had attained, but considered that he might achieve still greater triumphs, by sowing earlier in the year, and by cultivating a lower soil. They said that his New Orleans Cotton was the best that had ever been grown in India, and this they attributed to his having sown in June and July, instead of in September and October. But why not sow in May? The New Orleans plant in its native home in Mexico, grows spontaneously, or in other words propa- 92

Mr. Aspinall Turner's letter, 5th Feb. 1847. Parl. Return (1847) p. 424.

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gates itself; thus showing that its seeds ought to be in the ground at the commencement of the rains,—a season which corresponds in the district of Coimbatore to the commencement of the South-west monsoon in the month of May. Again, the New Orleans plant reaches its greatest perfection, and yields the best staple, in the low lands of tropical Mexico. When taken from the tropics and grown in the low lands of the United States, its staple is somewhat impaired, but still is better than Dr. Wight's Cotton; in other words, it is rather longer, more silky, and less harsh. Why not then sow New Orleans Cotton in India at a season, corresponding to its own spontaneous sowing season in Mexico?—and why not sow it on low lands near the coast, corresponding to the low lands where it reaches its greatest perfection?

93 **Dr. Wight's reply: July is the best time for sowing.**—Dr. Wight replied to the following effect. Before sowing, the land must be ploughed; and the ploughing cannot be carried out until some copious showers have fallen to soften and loosen the hard, sun-baked, and impenetrable soil. The present Farms in Coimbatore enjoy the benefit of both monsoons. The South-west rains rarely commence before the middle of May; and then the ploughing begins, and lasts for a month or six weeks. Consequently it is impossible to sow before July. But if we take the North-east monsoon into consideration, we shall see that the middle of July is after all the best sowing time. The plant is of rapid growth, requiring humid weather whilst growing, and dry clear weather whilst maturing. If sown in July it comes into flower about October, when the North-east rains invigorate it, and the subsequent dry season matures it. If sown earlier, the Cotton bolls are maturing at the very time when the rains are beginning. The consequence is that the plant is surcharged with sap; and then the Cotton, instead of maturing, absorbs the sap and rots in the capsule.

Dr. Wight's letter, 8th April 1847. Parl. Return (1857) p. 151.

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2nd, Low Alluvial soils had proved a failure, but low lands near the Coast were under trial.—As regarded the length and silkiness of the staple Dr. Wight admitted that the change was produced by the soil. Native Cotton dealers had long been aware of the fact, that Indian Cotton grown on Black land, had a longer and finer staple than when grown on Red gravelly soil. But still American Cotton had been more successfully cultivated on the Red than on the Black soil. Dr. Wight however had tried the low Alluvial lands, as more nearly resembling the best American soils than either Black clays or Red gravel. The result established the theory but not the practice. The Cotton produced was of excellent quality, but the yield was very uncertain; as a shower of rain, which would fall innocuous upon Cotton growing on a dry soil, would deteriorate half the crop on a low Alluvial. As regarded the cultivation of lands near the Coast, Dr. Wight coincided in the view taken by the Association, and reported that the experiment was in progress; Mr. Finnie, the planter, having been located in the centre of Tinnevelly, which was one of the best Cotton districts in the South of India, and within about forty miles of the eastern shore. 94

DR. WIGHT'S NOTES ON THE ADAPTATION OF THE AMERICAN PLANT TO THE SEASONS OF INDIA.

Habits of the American Plant.—Some time afterwards, Dr. Wight entered more largely upon the subject of adapting the time of sowing in Southern India to the habits of the American plant. Three things were to be observed:— 95

Dr. Wight's letter to Mr. Turner, 27th Sept. 1847. Parl. Return (1857) p. 167.

1st, That in average seasons, the New Orleans Cotton plant requires from six to eight weeks from the date of sowing to that of coming into flower; and about the same length of time from the fall of the blossom to the opening of the pod,

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2nd, That rainy weather, or even a dark, cloudy, damp atmosphere whilst the crop was maturing, has a tendency to prevent the boll from opening at the proper time; and if the opening of the boll is so checked, the Cotton becomes more or less deteriorated; varying in degree according to the intensity of the deteriorating cause, from absolute destruction to simple adhesion of the fibres, or to mere slight discolouration.

3rd, That the prevalence of rainy weather during the period of growth promotes luxuriance and productiveness, provided that the drainage is free; and provided also that this humidity is exchanged for clear bright weather at the season for maturing the crop.

96 **Four seasons of the American Plant.**—The American plant, like all other plants, must have four seasons, viz.—

1st, SPRING, or season of germination, when but a moderate quantity of moisture is required.

2nd, SUMMER, or growing season, which calls for more liberal supplies of moisture.

3rd, AUTUMN, or ripening season, which requires but little or none.

4th, WINTER, or season of rest.

Dr. Wight's letter, 26th Jan. 1849. Parl. Return (1857) p. 186. Compare Dr. Wight's circular, 20th March 1849. Ibid p. 221.

In America these seasons of the plant correspond with the natural seasons of the year; but in India they do not. In America the winter months are the season of rest; but in India the summer months are the resting season. Thus in India the Cotton spring and summer occur during the rainy season, whilst the Cotton autumn occurs during the dry heat of February, March and April.

Adaptation of the habits of the American Plant to the Indian seasons.—Having thus ascertained the habits and seasons of the American plant in those countries where 97
it has hitherto been most successfully cultivated, it will be next necessary to describe the characteristics of the seasons in India. Here we must take into consideration three different localities, each encountering different influences of the monsoons.

1st, Eastern, or Coromandel side,—under the influence of the North-east monsoon. Sowing time in September.

2nd, Western, or Malabar side,—under the influence of the South-west monsoon. Sowing time in May.

3rd, Intermediate localities,—under the influence of both monsoons. Sowing time in July.

Dr. Wight's observations upon the seasons in each of these localities will now be mentioned in order; first, describing the actual course of each season; and, secondly, indicating the best method of adapting the cultivation of American Cotton to the course of the seasons.

1st, Seasons on the Eastern side, under the North- 98
east monsoon.—The Eastern or Coromandel side of the Indian Peninsula is visited by some of the showers of the South-west monsoon, which in this quarter may be called the petty monsoon; but it is more immediately subject to the heavy rains of the North-east monsoon. The course of the seasons is accordingly as follows. The rains of the South-west monsoon, which are very uncertain in quantity, commence in the month of July, and continue in this quarter in the form of partial showers only throughout August and September. In October the heavy North-east monsoon commences, and continues with intervals of fair weather until about the middle of December, when the dry clear weather begins.

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99 **Monthly mean temperature and mean falls of rain in the Carnatic.**—The course of the seasons in the parts of India more immediately under the influence of the North-east monsoon, may be further illustrated by the following table of mean temperatures and mean falls of rain in Madras, during the Cotton growing season, as exhibited in the Madras Meteorological Register.

Months.	August.	September.	October.	November.	December.	January.	February.	March.	April.	Total.
Heat....	84·6	83·7	82·2	78·9	76·3	75·5	77·7	80·8	83·7	
Rain...	5·24	4·76	10·	12·42	3·25	1·33	0·23	0·36	0·63	38·22

100 **Cotton cultivation under the North-east monsoon: sowing in September.**—From the foregoing table it will be seen, that during the average run of seasons in the Carnatic, there is sufficient rain for carrying on all agricultural operations continuously, from the beginning of July until the end of December, whilst the subsequent four months are nearly dry. In August and September the showers of South-west rain are sufficient for the commencement of ploughing. From the beginning of September until the middle of October, sowing may be carried on. The crops which have been sown before the middle of September will be in a good state for benefiting by the rains of the heavy North-east monsoon. They will thus enjoy a clear uninterrupted growing season of about three months and a half, receiving almost every week more or less copious falls of rain. By the end of that time, namely about the beginning of January, the weather is dry, and continues so for four months. Thus by January the plants will have nearly attained their full growth; and shortly afterwards they will begin to yield the crop, and will then continue to do so for nearly three months longer. After September the sowing is not so safe,

as the North-east rains are apt to be so abundant, that unless the seed has germinated and is above ground, it is liable to rot in the earth from excess of moisture. Towards the end of November an opportunity is usually offered of sowing again for a late crop; but Dr. Wight believed that this late crop would always be uncertain for the following reason. The ground would be saturated with water, and consequently the plant would find nourishment near the surface, and would not strike deep root; the result of which would be, that when the cold dry weather set in, the plant would be impeded in its growth through the conjoint operations of cold and want of moisture.

2nd, Seasons on the Western side, under the South- 101
west monsoon.—On the Western or Malabar side of the Indian Peninsula, which is more immediately under the influence of the South-west monsoon, the course of the seasons is similar, only they commence earlier in the year. The first rains or showers begin in April and May. The proper South-west moonsoon rains, which are more certain and copious here than on the Eastern side, commence towards the end of May and beginning of June, and then continue until September.

Cotton cultivation under the South-west monsoon: 102
sowing in May.—The sowing season on the Western coast should therefore be in May, so as to have the plant well above ground before the commencement of the heavy continuous rains. Unless this be accomplished, in other words, unless the plant has vegetated, the heavy rains of June and July would cause the seed to rot in the ground. Whereas if the plant be above ground, the same heavy rains will promote its growth. Then again, allowing three months and a half for the growing season, the pickings will commence towards the end of September, by which time the rains are

CHAP. III. over and fine weather established.* The pickings should continue until the end of the year, unless prevented by excessive heat or a dry scorching atmosphere.

103 **3rd, Intermediate regions under both the North-east and South-west monsoons.**—The location of the new Farms in Coimbatore was rather too remote from either the South-west or the North-east monsoon. It participated in the rains of both, but not sufficiently so to enable Dr. Wight to trust entirely to either for his crop. The South-west monsoon however seems to be the one of which the influence was the most felt. The first rains fell in April and May, and the bulk of the monsoon in June and July, with occasional showers in August and September. In October the North-easterly rains set in, but rarely exceeded a few days duration. November is usually a clear warm dry month. In December, cold dry parching winds set in, and continue with more or less intensity until February, when they give place to soft humid westerly breezes.

104 **Cotton cultivation under both monsoons: sowing in July.**—Under the condition of two monsoons, Dr. Wight was undecided for some time as to which was the best month for commencing agricultural operations. One season, the early rains of the South-west monsoon fell in sufficient quantity to enable him to try the experiment of sowing in May, as suggested by the Manchester Association. But that crop turned out a failure. Experience proved that the proper sowing season was July and August, that is towards the close of the South-west monsoon. By this delay one great advantage was gained. The American plant really

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* It would almost seem from the description in the text that the Western side of the Peninsula is best adapted, as far as climate is concerned, to the growth of American Cotton, for the course of the seasons is essentially the same there, as in America. See para 151.

required very little rain when it was once well above ground. Consequently it was desirable to avoid the heavy rains of the South-west monsoon, when those of the North-east were quite sufficient By sowing in July and August the plant escaped the heavy rains of the South-west monsoon, and partook of the lighter rains of the North-east. Whereas by sowing earlier, the South-west monsoon brought the plants into full bearing just at the setting in of the North-east monsoon, which injured all the pods just as they were ready to burst. On the whole, Dr. Wight was not at this period very favorably disposed towards localities enjoying the benefits of both monsoons. He anticipated more certain advantages from lands nearer the coast; which were subject to one monsoon only, and which therefore did not perplex the grower by compelling him to adjust his operations, so as to avail himself of a double series of insufficient rains in the place of one ample monsoon.

Large experiment in early sowing throughout the Cotton Districts in the Madras Presidency.—The experiment of sowing the seed of American Cotton in the early spring rains, had been so strongly urged by the Manchester Association, and had been so strongly approved by the Court of Directors, that notwithstanding the experience of former trials, Dr. Wight did not hesitate to try the experiment on the largest possible scale. Accordingly, American seed was distributed to the Collectors at all the Cotton growing districts throughout the Madras Presidency, and again distributed by them to Native cultivators in the different talooks. The results induced Dr. Wight to regard this experiment as the most instructive that had ever been made; and one which led to a far better knowledge of the principles of the culture of the American Cotton plant in India than had then been attained. 105

Returns from the several Collectors, Parl. Return (1857) p. p. 74-79.

Dr. Wight's letter, 26th Jan. 1849. Parl. Return (1857) p. 186.

First Result: India not too hot, but too cold.—The experiment of sowing in May was tried over a wide extent 106

CHAP. III.

of country, and seemed to establish the following important facts. In the first place it was seen that India was not too hot for the American plant, since in the Carnatic it had borne unharmed the hot winds of May and June. On the other hand it was ascertained that the cultivating season in India was if any thing too cold; in other words that the climate of the Carnatic during the cold months, which formed the Cotton growing season in India, was actually colder than the summer of Mississippi, which formed the Cotton growing season in America: the Americans cultivating from April to November, and the Indian Ryots from September until April. In the first instance, Dr. Wight had noticed the great difference between those fields, or portions of fields, which were exposed to the cold; and those which were warmly sheltered. Again on the change of the monsoon, after the North-easterly rain had ceased, and when the thermometer in the house sunk daily to 60° and 65°, he had observed that all the young plants, the produce of October sowing, ceased to grow though the soil was abundantly moist.

107 **Theory confirmed by a comparison of the temperature of Madras with that of Vera Cruz, Mobile and Natchez.**—This theory, that the American plant in India suffered from the cold, was directly opposite to an opinion which had been expressed by Mr. Mercer, an American Planter under the Bombay Government, who had confidently asserted that India was too hot for the cultivation of American Cotton. It was however fully confirmed by a comparison of a meteorological register of the Cotton growing States in America with a similar register of Madras. In Mississippi the sowing commences in April; in the Carnatic the latter part of September, or even the beginning of October, is considered to be the best sowing time. The following four lines of figures exhibit the temperature of the Cotton season in four distinct localities; viz.

Dr. Wight's Circular, 20th March 1849. Parl. Return (1857) p. 221. Compared with Dr. Wight's letter, 26th Jan. 1849. Ibid p. 186.

1. Vera Cruz, 19·12 north latitude, which is one of the native districts of the American plant.

2. Mobile in Alabama, 30·12 north latitude.

3. Natchez in Mississippi, 31·32 north latitude.

4. Madras, 13·4 north latitude.

	April.	May.	June.	July.	Aug.	Sept.	Oct·	Nov.	Dec.
Vera Cruz.	77·18	80·42	81·86	81·50	82·10	80·96	78·41	75·38	71·6
Mobile.. ..	70·00	76·36	82·17	82·41	82·73	75·94	69·97	61·50	55·50
Natchez ..	69·93	72·72	80·62	81·78	80·13	74·99	64·58	55·23	49·09
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
Madras....	84·6	83·7	82·2	78·9	76·3	75·5	77·7	80·8	83·7

Rising temperature in America, but diminishing temperature in India during the growing season.— 108
From the foregoing table it will be seen that in America the seed is sown at a comparatively low temperature, which gradually rises as the plant advances to maturity; whilst in India it is sown at a comparatively high temperature, which gradually falls as the plant matures. In Mississippi, the seed is sown in April at a temperature of 70°, which gradually rises from month to month until July, when it nearly reaches 82°, and the Cotton is nearly ripe. In August the pickings are approaching their maximum, and then the temperature is as high as it is in India during the picking season of March. In India on the contrary, the American plant has to contend with a diminishing temperature instead of a rising one during the growing season. Here the seed is sown in October at a temperature of 82°, which gradually diminishes as the plant approaches to maturity, and when the Cotton is most in need of heat and light. Thus at the outset of life, the young plant is stimulated by strong light and high temperature, neither of which is sustained through the growing season; and in January, when

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the state of the crop calls for a high temperature, we have it about the lowest, being nearly six degrees lower than the mean temperature of Mississippi at the same stage. This state of things must prove more or less injurious to the health of a plant so tenacious of heat and light.

109 **Second Result: Carnatic not too dry, confirmed by a comparison of mean rain fall.**—Another important fact was ascertained at this time. Mr. Finnie, the American Planter, had asserted that the climate of the Carnatic was much too dry; and that we could not expect to succeed in the culture of American Cotton, excepting in such places as partook of the rains of both monsoons. This theory however was completely disproved, and the opposite one established. The experiment already indicated was tried in the Carnatic at a season when the American plant had to struggle against a four-months uninterrupted drought, a very rare circumstance; but even under such unusual conditions, the plant not only survived the unusual drought, but when the rain did fall, it grew vigorously and produced a good crop. This result is further confirmed by a comparison of the monthly mean falls of rain in Florida and Madras during the Cotton growing seasons in both countries; from which it will be seen, that the climate of the Carnatic as compared with that of the Cotton growing country of Florida, is the more humid of the two.

See paras 127,133.

	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Florida.	1·09	6·34	2·39	2·84	3·30	4·35	3·33	1·49	1·13	26·16
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr	
Madras..	5·24	4·76	10·	12·42	3·25	1·33	0·23	0·36	0·63	38·22

110 **Two Methods of cultivating American Cotton in India: adaptation of seasons, and artificial irrigation.**—Two methods suggested themselves for adapting the American Cotton plant to the Indian seasons. 1st, The ar-

rangement of sowing seasons already indicated in the localities under the influence of the North-east monsoon, or under the influence of both monsoons; namely, that of employing the earlier weeks of the regular autumnal period as the Cotton spring season, the later weeks and part of winter as the Cotton summer season, and the conclusion of winter and part of spring as the Cotton autumn. 2nd, The employment of irrigation as in Egypt; by which course the Indian cultivator would be comparatively independent of the seasons, as by sowing in November he would secure for the growing plant a rising range of temperature in the place of a falling one.

Experiments in irrigation, securing a rising temperature to the growing plant.—Dr. Wight first tried 111
the experiment by sowing an acre of ground about the end of January. On the 4th of February the young plants began to appear above ground. On the 10th of March many of them were upwards of a foot high, all very healthy and already showing abundance of "forms," or coming flowers; and that too with the thermometer in the shade daily above 90°, once or twice 96°; thus proving clearly that high temperature, when there is sufficient moisture in the soil, is not injurious to New Orleans Cotton. This experiment however was only undertaken to establish the principle, as the cloudy weather and rain in May, would interfere with the perfect maturation of the crops. Had the sowing been earlier, that is immediately after the cessation of the North-easterly rains, then a full crop would have been obtained. Fortunately the latter experiment had been tried by Captain Lawford, Civil Engineer. Captain Lawford wished to prove to the Natives of Tanjore, that Cotton cultivated under irrigation was as productive as Rice. The seed was sown in November, and the pickings commenced about the middle of February. Dr. Wight however recommended that in carrying out this irrigation method,

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the water should be sparingly applied, and that little or none should be given from the commencement of the picking.

112 **Five practical suggestions.**—Having thus explained the principles of American Cotton cultivation in India, Dr. Wight proceeded to discuss five questions of practical detail; viz.—1st, Choice of soil; 2nd, Preparation of the land for the seed; 3rd, Ploughing and hoeing during the growing season; 4th, Distance between the rows; and 5th, Treatment of the plant as an annual and rotation of crops. These points have already been noticed in previous paras; but it seems advisable to repeat the conclusions here.

Dr. Wight's Circular, 20th March, 1849. Parl. Return (1857) p. 221.

113 **1st, Choice of soil.**—Dr. Wight observed on this point, that the best crops of American Cotton which he had as yet seen, had been obtained from dark brown, very light, sandy loams, mixed with much kunkur limestone;* a kind of soil easily worked, very permeable to rain, and easily penetrated to a great depth by the roots. Red soils, which had a large admixture of sand securing for them the same properties, had also answered well, and were easily cultivated. Stiffer clayey soils had not answered so well, excepting in seasons when showers were frequent and kept the ground in an easily workable state; otherwise when the weather was dry, these soils were liable to bake and become very hard. Black Cotton soils had been a good deal tried at first; but still Dr. Wight considered that they had been condemned as unsuitable rather too prematurely. Subsequent consideration had led him to doubt the justice of the verdict.

114 **2nd, Preparation of the land for the seed.**—Too much care, says Dr. Wight, cannot be bestowed upon the preparation of the ground for the reception of the seed.

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* The presence of this kunkur, was the very thing that Mr. Simpson the American Planter had urged as rendering the land unfit for the growth of American Cotton. See para. 77.

From four to six months before the sowing time, the land should be well ploughed, the deeper the better, and then should be allowed to lie fallow. If rain fell in the interval, then a second ploughing should take place, so as to keep the land thoroughly open and freely exposed to the conjoint action of the air and sun; this would prevent excessive absorption of heat; it would greatly promote fertility; and it would clean the land by exposing and killing the roots of all perennial weeds. Last of all, just before sowing, the ground should have a final ploughing.

3rd, Ploughing and hoeing during the growing Season.—The ploughing and hoeing during the growing 115
season of the American Cotton plant should be regulated as follows. If the seed is sown in drills according to the American practice, then, whilst the plant is still small, the land should be ploughed once or twice between the rows. If the seed be sown broadcast, this ploughing cannot be conveniently carried out; and then the hoe must suffice. When the third leaf has appeared, the ground must be hoed, and the plants thinned out to six or eight inches between them; and this will leave enough to allow of considerable destruction during the subsequent ploughing. A second hoeing is always deemed necessary, in both American and Native practice, when the "stand" should be further thinned, to an extent varying from a foot to eighteen inches between the plants. If the growth is vigorous, the distance between the plants should average not less than eighteen inches, but otherwise, an interval of one foot would be sufficient.

4th, Distance between the Rows.—The distance be- 116
tween the rows and ridges should be regulated as follows. In moderately fertile and high and dry lands, it will be sufficient to have an interval of from two feet and a half to three feet between the rows. But for moist low-lying rich

CHAP III. soils an interval of five feet is not too much ; as under such circumstances the bushes will still fill the ground, for the plant is a very strong growing one, and unless it has plenty of room the crop blights.

117 **5th, Treatment of the plant as an annual and rotation of crops.**—The last point to which Dr. Wight drew attention, was the fact that the experiment of treating the plant as a biennial, already noticed, had uniformly failed ; that however promising in appearance the second years plants might be, he had never succeeded in obtaining a really good crop off the same bushes. He would therefore always recommend the plan of cultivating the New Orleans Cotton plant is an annual. Again, as regards rotation of crops, he would recommend that the same land should never be sown oftener than every third or fourth year, as the foreign Cotton seems to be a very exhausting crop.

Para 64.

118 **Profitable cultivation of American Cotton throughout the Peninsula.**—The final results of Dr. Wight's experience in 1849, may thus be summed up in a few words. He considered that, under the guidance of the principles already laid down to suit particular localities, the cultivation of American Cotton might be successfully carried on throughout the Peninsula, excepting perhaps on the high table lands where the climate is too cold.

Dr. Wight's letter, 26th Jan. 1849. Parl. Return (1857) p, 189.

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119 **Plans for extending the American Cotton Culture amongst the Ryots, 1845-49.**—Before concluding the present Chapter, it will be necessary to glance at the efforts which had been made to introduce American Cotton and American cultivation amongst the Ryots. It has already been seen that prior to removing his Farms in 1845, Dr. Wight had endeavoured to extend the cultivation of American Cotton amongst the Ryots, partly by distributing American

Cotton seed, but chiefly by engaging to purchase the produce at a higher rate than the market value in India; this higher rate being adjusted to the relative market prices of American and Indian Cotton in the home market. Dr. Wight considered that this step was necessary to secure the Ryot against personal loss, until the American Cotton should have obtained an established market value in India. These offers however failed to encourage the Ryots. For some time they held back altogether, but at last in the first season at the new location, viz. in 1845-46, some Ryots were induced to attempt the cultivation. Unfortunately, instead of sowing the American seed in July and August, they waited until the setting in of the North-east monsoon, and thus sowed it in October with the Native plant. Accordingly, the experiment turned out a failure, and no purchases appear to have been made.

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See para 84.

Dr. Wight's letter, 16th Feb. 1846. Parl. Return (1847) p. 402.

Court of Directors order 6000 bales of East India Cotton, 1845.—Meantime the Court of Directors had directed that 5000 or 6000 bales of East India Cotton, cleaned by the saw gin, should be sent out to England at one time; in order that some conclusive result should be arrived at respecting the merits of the article. This necessitated large purchases of Native seed Cotton from the Ryots, for the purpose of submitting it to the action of Dr. Wight's saw gins at Coimbatore. In 1846-47 nearly £1,200 or 12,000 rupees were expended; in 1847-48 the purchases reached £2,100, and in 1848-49 they amounted to nearly £2,600. 120

Dispatch of the Directors, 26th Nov. 1845. Parl. Return (1847) p. 398.

Parl. Return (1857) p. 140-143.

Proposition for reducing the assessment of lands under American Cotton cultivation.—In 1847, the Manchester Association had recommended that the whole of the 6000 bales should consist of American Cotton. Accordingly Dr. Wight began to consider how to extend the cultivation of the foreign article. He at once made known to the local merchants who frequented the gin house, 121

Letter of Mr. Aspinall Turner, 5th Feb. 1847. Parl. Return (1847) p. 424.

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that he was in expectation of orders for stopping the purchase of Native Cotton; and he again offered to supply American seed and to purchase the produce, but without any apparent success. Accordingly he proposed that a remission of 25 per cent. should be made, for a term of three or five years, on all lands under American Cotton cultivation. Mr. Wroughton, the Collector of Coimbatore, stated in reply, that in 1833, Government had offered to remit one half of the fixed assessment on the same proviso; but that even that larger encouragement had failed to produce any extension of the cultivation, and therefore Government had deemed it inexpedient to continue the indulgence. Mr. Wroughton at the same time expressed an opinion that any such interference with the long standing survey settlement of the district was a very dangerous and doubtful experiment, and likely to be productive of much confusion and irregularity; and he suggested that if the amount of the proposed remission of 25 per cent. should be deemed necessary for the extension of the American Cotton cultivation, the amount should be added to the price given for the Cotton when produced, in lieu of a reduction of the rent of the soil. Dr. Wight however had already offered this increased price for the American Cotton, but without effect. Accordingly he applied to the Madras Government to renew, for a further period of five or ten years, the orders of 1833, granting 50 per cent. remission on all lands under American Cotton cultivation.

Dr. Wight's letter, 14th June. 1847. Parl. Return (1857) p. 155.

Mr. Wroughton's letter, 15th June 1847. Parl. Return (1857) p. 156.

Dr. Wight's letter, 20th June 1847. Parl. Return (1857) p. 153.

122 **Marquis of Tweeddale in favour of the remission.** —The Marquis of Tweeddale was in favour of the proposed remission. He considered that if granted, it would only bring a larger breadth of land under the plough; inasmuch as a foreign demand for the American Cotton of India would in no way interfere with the Indian demand for its own raw produce; consequently the same extent of land would

Minute of the Marquis of Tweeddale, 3rd Sep. 1847. Parl. Return (1857) p. 158.

still be cultivated to meet the wants of the home consumer, and the same rental would be received by Government; the only difference being that more waste land would be taken into cultivation to meet the foreign demand for American Cotton of Indian growth.

Court of Directors decide against the remission.— 123
The Court of Directors refused their consent to the proposed remission. They considered it would be an obvious violation of the general principle, which prescribes that the assessment shall be regulated by the capability of the land, without any reference to the particular description of produce which might be raised from it. Again, even supposing that American Cotton could be cultivated with profit only when half the rate of assessment was remitted; and that this profit would cease when the rate of assessment was again raised to its original amount; this fact would simply prove that the remission was forcing a factitious cultivation, which under ordinary circumstances could not be carried on. However, it was the belief of the Directors that no such reduction was required in the province of Coimbatore; for the out-turn of American Cotton per acre was much larger than that of Indian Cotton, and at the same time far more valuable in the English market. The real difficulty in the way of inducing the Ryots to extend the cultivation of the American Cotton, was the want of a steady demand for the article in the district in which it was grown. That difficulty however was removed for the present by the permission, which had been given to Dr. Wight, to purchase American Cotton from the Ryots on account of Government at remunerating prices.

Despatch from the Court of Directors, 4th July 1848. Parl. Return (1857) p. 180.

Failure of the purchase system as regarded American Cotton, 1848.—Meantime however the purchases of New Orleans Cotton effected by Dr. Wight were insignificant in the extreme. He was by no means sparing in his 124

Dr. Wight's letter, 2nd June 1848. Parl. Return (1857), p. 181.

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offers of high prices. Whilst Native Cotton was sold to him at the gin house for eight annas (or one shilling) a maund of 25 lbs., he had announced that he was prepared to purchase all first class New Orleans Cotton at double the price, that is at one rupee (or two shillings) per maund. But still the Natives were so averse to depart from their established customs, that he had only been able to persuade a small number to cultivate the foreign plant. At the same time the Cotton markets in Coimbatore had been so sparingly supplied with purchasers during the two previous seasons, that but for the Court's order for 6,000 bales of gin cleaned Native Cotton, the trade must have been almost at a stand still.* Under such circumstances, Dr. Wight seriously thought of proclaiming throughout the district, that for the future he should only buy American Cotton; and that he was prepared to purchase all of that description which might be offered for sale. He was aware that there were strong objections to this course; but whilst so many Ryots offered their Cotton for sale at his gin house before they took it elsewhere, he considered that the plan might be attended with beneficial results. These explanations, he trusted, would prove that the failure to induce the Ryots to cultivate American Cotton did not arise from any want of encouragement, as a ready market and high prices were offered to all comers.

Dr. Wight's letter, 26th Jan. 1849. Parl. Return (1857) p. 189.

125 **Contemplated establishment of a number of small Farms.**—In the early part of 1849, Dr. Wight considered of a new plan for extending the cultivation of the American Cotton amongst the Natives. The principles

* It seems not improbable that Dr. Wight had himself kept the Native purchasers out of the Coimbatore markets. At Dr. Wight's gin house the Ryot could obtain a ready sale, liberal prices, and immediate payment for Native Cotton. It was not therefore likely that the Merchants would care to compete with so formidable a rival. They would rather purchase elsewhere, and leave the field open to Dr. Wight.

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of the culture he considered to be fully established, whilst the practice had been simplified to the utmost. He therefore proposed, after the close of the season 1848-49, to form a number of small Farms, of from twenty to fifty acres each, to be cultivated by hired labour under the direction of Native Maistries; in the hope of familiarizing all classes of cultivators with the improved practice, and satisfying them that American Cotton could be cultivated by their own implements, with as much care, cheapness, and certainty as the Native plant, whilst the produce was far more valuable. At the same time he contemplated diminishing the extent of his own Farms, in order to allow of more leisure for superintending the smaller detached ones above described. Meantime, however, circumstances had arisen which led to his temporary retirement from the Cotton experiment. These will be found narrated in the fifth chapter. But before drawing attention to these matters, it will be necessary to review the proceedings of Mr. Finnie in Tinnevelly, to which accordingly the next chapter will be devoted.

CHAPTER IV.

FOUR YEARS OF EXPERIMENTAL CULTURE UNDER MR. FINNIE IN TINNEVELLY.

1845 TO 1849.

(126.) Labours of Mr. Finnie and Dr. Wight compared. (127.) First Season, 1845-46: Mr. Finnie's first impression of Tinnevelly. (128.) Suggestion that by acting as a Cotton Agent he could induce the Ryots to adopt the new culture. (129.) An Agency would also increase the profits of both Ryots and Merchants, and double the exports. (130.) Nothing however would induce the Ryots to adopt the American *Saw* Gin. (131.) The Thresher recommended. (132.) Three points in the career of Mr. Finnie: the New Orleans Cotton, the Agency, and the Saw Gin. (133.) Cultivation of Cotton: tour to Courtallum, under both monsoons, 1846. (134.) Necessity for the co-operation of the Natives: employment of hired labour by the European always a loss. (135.) First intercourse with the Ryots: allays fears and suspicions. (136.) Explains the improved method of culture to the Ryots. (137.) Mr. Finnie's tour from Courtallum to Coimbatore, July. (138.) Preparations for assisting Dr. Wight in completing the Court's order for 6000 bales. (139.) Mr. Finnie permitted to act as Agent: restricted to Cotton ginned and prepared on the American principle, August. (140.) Restriction removed. (141.) Mr. Finnie's first years proceedings with the churka, thresher and gin. (142.) Queries submitted to Mr. Finnie by the Marquis of Tweeddale.

MR. FINNIE'S "NOTES ON COTTON CULTIVATION IN AMERICA AND INDIA."

(143.) Early cultivation of Cotton in America: compared with the present cultivation in India. (144.) Climate discovered to be of more importance than soil. (145.) Nature of the lands in America, on which the American plant is grown. (146.) Manure: consisting of old stocks and rotten seed buried in a furrow between the rows. (147.) Climate: very humid at night but hot in the day. (148.) Rotation of crops: alternation with Indian Corn occasionally necessary. (149.) Capital required in American cultivation. (150.) Successive operations necessary to raise a crop: cleaning old land and clearing new. (151.) Planting. (152.) "Scraping" or hoeing. (153.) Gathering. (154.) Uncertainty of weather: average crops. (155.) Expenses of Cotton cultivation: produce estimated, not at so much per acre, but at four to eight bales per Negro. (156.) Machinery: Gin-

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House, Gins, Press, and Driving Machinery. (157.) Price of land: fluctuates with the price of Cotton. (158.) Minimum price at which American Cotton could be produced, four pence per pound. (159.) Prospects of India: labour in America and India compared. (160.) Reduction of the Indian Land-tax on Cotton grounds would neither benefit the Ryot nor extend the culture.

(161.) Mr. Finnie's second season, 1846-47: planting operations succeeded at Courtallum but failed at Sevacausey. (162.) Mr. Finnie is disappointed as an Agent. (163.) Mr. Finnie's second year's operations with the churka, thresher, and gin. (164.) Sale of two gins to neighbouring Zemindars: their failure. (165.) Cotton Brokers rather than Zemindars should be induced to adopt the Gin. (166.) Mr. Finnie's proposal for erecting a Gin-House and Cattle Driving Machinery in Tinnevelly. (167.) Purchase of Cattle Driving Machinery sanctioned: relative cost of cattle labour and manual labour. (168.) Change in Mr. Finnie's views as regards the Cattle Driving Machinery. (169.) Mr. Finnie's explanation of his apparent inconsistencies. (170.) Mr. Finnie's general objections to the gin discussed by Dr. Wight. (171.) Mr. Finnie's proposition for erecting a gin house of two stories: the lower one for the Driving Machinery and the upper one for the gins. (172.) Hire of a temporary gin house at Aroopoocottah. (173.) Erection of three gins and a thresher: their effect upon the Natives. (174.) Testimony of the Brokers that dirty Cotton was more profitable than clean Cotton.

MR. FINNIE'S NOTES ON THE PECULIARITIES OF COTTON TRADE IN TINNEVELLY.

(175.) Systematic adulteration of Indian Cotton: transactions between the Ryots, the Brokers, the Chetties, and the European Agents. (176.) The Ryot: improvident and helplessly in debt. (177.) The Broker: adulteration of the Cotton by the "Devil's dust" system. (178.) The Chetty: tricks played with the European Agent.

(179.) Conclusion of the season of 1846-47, difficulties in the way of conducting the ginning operations at Aroopoocottah. (180.) First, High prices demanded by the Ryots for their seed Cotton. (181.) Second, Heavy expenses of ginning. (182.) Necessity for improving the construction of the gin. (183.) Third season, 1847-48: stage of the Cotton experiment in Tinnevelly. (184.) Planting operations: successful culture of American Cotton in the Courtallum valley. (185.) Unsuccessful culture at Sevacausey, Virdooputty, and Aroopoocottah. (186.) Agency operations: Mr. Finnie requests permission to proceed to England to consult with the Cotton Manufacturers. (187.) Operations with the churka, thresher and gin: meeting of Cotton Brokers of Tinnevelly. (188.) Cost of cleaning with the thresher and churka as compared with that of the gin. (189.) Cost at which clean unadulterated Cotton might be supplied. (190.) Recom-

mends the introduction of small hand threshers and cheap presses. (191.) Small hand threshers and presses sanctioned. (192.) Mr. Thomas believed that Cotton was not adulterated by design, and that good Cotton was often sent home. (193.) No market or Agency required in Tinnevelly. (194.) Cultivation of New Orleans Cotton, and improved cleaning, the main points. (195.) Mr. Finnie's design for a cheap Cotton press. (196.) Mr. Finnie's sample of churka-cleaned Tinnevelly Cotton equal to American. (197.) Madras Government refer the sample to Dr. Wight, the Chamber of Commerce, and the Court of Directors. (198.) Dr. Wight's report: Mr. Finnie's sample is "good Tinnevelly," which no one could mistake for American. (199.) Large shipments of churkaed Cotton contrary to the orders of the Directors. (200.) Dr. Wight's system of purchase compared with that of Mr. Finnie's. (201.) Madras Chamber of Commerce confirm Dr. Wight's valuation of Mr. Finnie's Cotton. (202.) Manchester Commercial Association pass a similar judgment upon the Cotton. (203.) Fourth season, 1848-49: proposed extension of planting operations. (204.) Mr. Finnie's matured judgment against the culture of American Cotton or use of the American gin. (205.) Pronounces in favour of the Indigenous Cotton and Native churka. (206.) Native Cotton should first be threshed, next churkaed, and finally cleaned by hand. (207.) Erection of Mr. Finnie's Gin house and Driving Machinery at Sevacausey. (208.) Relative cost of the churka, the hand gin, and the cattle gin. (209.) Mr. Finnie refused permission to extend his operations to Coimbatore.

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FOUR YEARS OF EXPERIMENTAL CULTURE UNDER
MR. FINNIE IN TINNEVELLY.
1845 TO 1849.

Labours of Mr. Finnie and Dr. Wight com- 126
pared.—In the two preceding chapters, we have seen Dr. Wight engaged in Coimbatore in endeavouring, by successive experiments, to lay down the true principles of Cotton culture in the Madras Presidency; and also in endeavouring, by large purchases from the neighbouring Ryots, to fulfil the order of the Court of Directors for 6000 bales of ginned East India Cotton. Meantime, that is during the second period of four years extending between 1845 and 1849, Mr. Finnie had been engaged in a totally different line of operations in the South. From the very first, the latter gentleman evidently had no heart in the efforts that were being made to introduce the cultivation of American Cotton, and the use of the American Machinery, into this Presidency; but whether he acted from a sincere conviction of their inutility, or whether, as a patriotic American Planter, he systematically endeavoured to throw cold water upon the objects in view, must be entirely left to the judgment of the reader. It will be sufficient to say that, as regarded both the New Orleans plant and the saw gin, he did as little as he possibly could; and that, if he exerted himself at all, it was chiefly to vaunt the Native Cotton and the Madras churka. In other respects however, the narrative of his labours will prove highly valuable. As a Planter, he possessed a practical knowledge of American Cotton cultivation as it was carried on in the Southern States; whilst during his residence in India, he had familiarised himself to a con-

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siderable extent with the character of the Ryots, and with the mode of carrying on the Cotton trade in this country. Both these points will be largely illustrated in the following paras ; and as Mr. Finnie was also a man of sense and shrewdness, his own observations, extracted and condensed from his official letters, will throw considerable light upon the actual condition of the Cotton trade and cultivation in the Madras Presidency ; though they may convey a generally unfavorable impression respecting the possibility of any great improvements being speedily carried out through the aid of American seed or American machinery.

127 **First season, 1845-46 : Mr. Finnie's first impressions of Tinnevelly.**—Mr. Finnie proceeded to Tinnevelly in October 1845. His ostensible objects were to distribute American Cotton seed amongst the Ryots, and to exhibit the working of some small sized saw gins. It seems also to have been expected that he should cultivate some American Cotton, partly to test the capabilities of the district, and partly to instruct the Natives in the improved method of cultivation. On reaching Tinnevelly however he found that the sowing season was over, and accordingly he could do little beyond recording his first impressions, and submitting a plan of operations to the authorities. As regards the capabilities of the Tinnevelly district, he appears to have at this time formed a favourable opinion. Both the New Orleans and the Sea Island varieties might, he thought, be grown in Tinnevelly ;—the New Orleans in the vicinity of the hills, where it would receive the benefit of both monsoons ; and the Sea Island on the coast, about seven to fifteen miles from the Sea, where it would be near enough to enjoy the benefit of the Sea breeze, and far enough off to secure a better soil than could be obtained immediately on the shore. As regards the Native cultivation he was less sanguine. The Natives sowed their Cotton broad cast, frequently with

Mr. Finnie's letter, 26th Jan. 1846. Parl. Return (1847) p. 417.

other kinds of produce, and then left it to take its chance; so that it was a mystery to him how they obtained a Cotton crop at all. If however they could only be induced to pay more attention to the cultivation, to plant their Cotton by itself and after a more regular fashion, and to gather their crops in a cleaner style, the ordinary Native Cotton might soon be rendered equal to Upland Georgia. There would however be considerable difficulty in persuading the people to adopt an improved culture and improved machinery. Europeans might carry on their new methods for ages with the greatest success, but the Natives would never follow their example, but would consider the whole operation to be a peculiar trick on the part of the Europe gentlemen, in which they had no interest or concern.

Suggestion, that by acting as a Cotton Agent, he could induce the Ryots to adopt the new culture. 128
—Under these circumstances, Mr. Finnie proposed that he should be allowed to act as an Agent for the produce of Cotton. Thus, whilst, as a Government Servant, he would be teaching the Ryots an improved method of culture; he would, as a Commercial Agent, be engaged in affording them direct encouragement to carry his agricultural precepts into practice, by offering them higher prices for the Native article. He therefore proposed to set up a "Tinnevelly Cotton Agency"; and either to make large shipments of Cotton to the Court of Directors, or to announce by circular to the different merchants at home, that he was prepared to supply the article.

An Agency would also increase the profits of both Ryots and Merchants, and double the exports. 129
—Mr. Finnie's arguments were not unlike those of Mr. Fischer already noticed in para 38, and may be exhibited thus. The Cotton in this country goes through too many hands. The Cotton is purchased from the Ryots by the Native

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Chetties, who again sell it to the European Agents on the Coast, who again are not buying it for themselves, but for European merchants in England. Thus the Chetty cheats the Ryot from whom he buys, and the Agent to whom he sells, and the price of the Cotton is further swollen by the charges of the European houses of Agency. In Tinnevelly, upwards of 50,000 candies of Cotton are shipped every year at a cost of some 25 lakhs of rupees, or £250,000 ; the mere shipment of which occupies eight Agency houses on the Coast, whose charges alone are equal to 12 per cent. on the whole. All this Cotton, he represented, might be shipped by one or two Agency houses, which would so far reduce the expenses as to encourage the home merchants to largely increase their trade. Again, by purchasing direct from the Ryots, the iniquitous services of the Chetties would be dispensed with, and the Ryots would reap the full reward of their labours.

130 **Nothing however would induce the Ryots to adopt the American Saw Gin.**—As regards separating the staple from the seed and cleaning it for the home market, Mr. Finnie believed that nothing, not even an agency, would induce the people of India to recognize the advantages of the American saw gin. The circumstances of America and India, in respect to the use of this machine, were altogether different. In America, where slave labour was valuable and time was money, a Planter could invest his capital profitably in machinery. In India, on the contrary, the bulk of the people were not employed for one third of their time, and a man was willing to labour for three rupees a month, during which period he would in his own rude way clean a candy of Cotton, or 500 lbs. Was it likely therefore, that a Native would pay four rupees for having a candy of Cotton cleaned in six hours by an American gin ? If the man could get no employment during that month, he would

lose the whole four rupees; and even if he did get work elsewhere, he would still be the loser of one rupee. Again, when the Cotton was separated from the seed, the seed was still useful to the people as food for cattle, but it could be of no value to an Agency. If however an Agency were established in the Cotton districts for the purchase of the Cotton seed; and if the Natives agreed to give a fair price for the seed after it had been separated from the Cotton; then it might be worth the Agent's while to employ the gin, for the sake of the superior cleanness of the ginned Cotton. But it must be borne in mind that the carriage of the seed and staple to the Agent's gin house, would be infinitely more expensive than the carriage of the staple alone; and that the carriage of the seed back again after the ginning, would prevent the people from giving much for it. If therefore from the increased cost of carriage, the price of the staple and seed, before separation by the Agent's gin, was equal to the price of the staple and seed after separation by the Native churka, it was clearly impossible that the extra outlay for ginning could be made to pay.

The Thresher recommended.—Under such circumstances, Mr. Finnie considered it best to leave the people to separate the staple from the seed by the churka; and to employ some machine which could clean the dust and trash out of the wool. For this purpose he recommended the "thresher" already described in para. 27, as cleaning the Cotton prior to its separation by the churka, as effectually as the brush wheel cleaned the Cotton after it had been separated by the saw gin. But notwithstanding this expression of opinion, Mr. Finnie was prepared to set up saw gins worked by cattle, and to exhibit their working to the people. He was indeed expecting the arrival of a thresher from Calcutta; but this he proposed to set up together with the gins, as both gins and thresher could be worked by the 131

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same driving machinery. Meantime however he intended to ascertain if the people would use gins worked by hand, provided the machines were let out on the toll system. Accordingly he asked and obtained three hand gins from Dr. Wight; two of twenty five saws each and one of twenty saws.*

132 **Three points in the career of Mr. Finnie: the New Orleans Cotton, the Agency, and the Saw Gin.**—It will be seen from the foregoing paras, that the three objects which Mr. Finnie had put forward were connected with the cultivation of New Orleans Cotton, the encouragement of the Ryots by purchasing Cotton as an Agent, and the introduction, or rather non-introduction, of the saw gin. Accordingly, in narrating his proceedings the three lines of operations here indicated will be kept distinct as much as possible. Thus, in noticing the proceedings of each season, we shall relate, first, what Mr. Finnie achieved in reference to the cultivation of American Cotton, either by himself or by the Natives; secondly, what success attended his operations as a Cotton Agent; and, thirdly, what he actually did as regards the churka and the saw gin.

133 **Cultivation of Cotton: tour to Courtallum under both monsoons, June 1846.**—It has already been stated that Mr. Finnie reached Tinnevelly too late in the year 1845, to attempt the cultivation of American Cotton during that season. Also that he had been strongly impressed with the opinion, that New Orleans Cotton would grow wherever the country enjoyed the benefit of both monsoons. Accordingly in June 1846, Mr. Finnie proceeded on a tour to Courtallum in the Western portion of the Tinnevelly district, which

Mr. Finnie's letter, 20th June 1846. Parl. Return (1857) p. 263.

* These remarks of Mr. Finnie against the employment of the American gin in India were subsequently referred to Dr. Wight, whose reply will be found at para. 170. For the sake of clearness, however, it will be advisable to continue the narrative in exact chronological order.

lies under the range of mountains between Tinnevelly and the Native state of Travancore, and which enjoys the influence of both the North-east and South-west monsoons. CHAP. IV.

Necessity for the co-operation of the Natives: employment of hired labour by the European always a loss.—Mr. Finnie's ultimate object was to test the capabilities of the large area of country, thus peculiarly situated, for the cultivation of the New Orleans variety. But his more immediate object was to interest the people directly in the new cultivation, by inducing some of the more influential Ryots to plant an acre or two each, on their own account, but according to his directions. Nothing indeed could be done without the co-operation of the people; for it was an established fact, that if the people would but adopt the improved agricultural method, they could always produce the raw material, whatever that material might be, very much cheaper than any European could do by the hired labour system. Mr. Finnie knew from experience, that the hired labour system afforded such numerous opportunities for peculation, that it was impossible for a capitalist to follow that system with any profit in India in the growth of any article whatever. 134

First intercourse with the Ryots: allays fears and suspicions.—On the 1st of June 1846, Mr. Finnie reached Courtallum, and made the people acquainted with his object. On the 3rd, he was visited by some of the more respectable Ryots, who asked for an explanation of his object, and at the same time expressed their own doubts and fears. First, they thought that Mr. Finnie aimed at getting possession of their lands; but he assured them that he wanted nothing beyond the bare trial of the experiment, on a small scale the first year, and then if successful on a larger scale the next. Secondly, they expressed a fear that, if the new Cotton succeeded, the Government would raise their assessment; but 135

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upon this point he succeeded in satisfying them. Thirdly, the question arose as to where they should sell the new Cotton. This last argument Mr. Finnie had as yet no authority to parry; but at last he made himself responsible, and promised to take all the new Cotton off their hands at the real value of the article.

136 **Explains the improved method of culture to the Ryots.**—Having thus satisfied the scruples of the Natives, Mr. Finnie went out and planted a small field before their eyes. At their desire he then accompanied them into the country to look at their fields; and the party increased in numbers as it proceeded, until at last he had fifty or sixty people with him, all anxious to adopt the new plan and asking for seed. These results encouraged Mr. Finnie to believe, that the people would speedily cultivate the American Cotton throughout the whole area under the influence of both monsoons: whilst those who only cultivated the Native Cotton under the North-east rains, would gradually adopt the new plan of sowing in rows, and of ploughing between the rows.

137 **Mr. Finnie's tour from Courtallum to Coimbatore, July.**—On the 1st of July, Mr. Finnie set out from Courtallum on a kind of exploring and itinerant Cotton planting expedition, along the foot of the hills northwards to Coimbatore. During this tour he was disappointed as to the extent of the area of country enjoying the benefit of both monsoons. Soon after leaving the vicinity of Courtallum, he found the land deprived altogether of the Southwest monsoon; and all was arid and sterile, until he had advanced beyond Pulney in the Madura District, and reached the borders of the district of Coimbatore. There, however, the South-west monsoon rushes through the Paulghatcherry Pass, and fertilizes a large extent of country.

Mr. Finnie's Diary, Parl. Return (1857) p. 339.

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Preparations for assisting Dr. Wight in completing the Court's order for 6000 bales.—During Mr. Finnie's short stay at Coimbatore, Dr. Wight had an opportunity of conversing with him, upon the exertions necessary for completing the order of the Court of Directors for 5000 or 6000 bales of ginned East Indian Cotton. Dr. Wight had already despatched three saw gins to Mr. Finnie, and he subsequently applied to the Madras Government that Mr. Finnie might be permitted to purchase seed Cotton for ginning. 138

Dr. Wight's letter, 28th July, 1846. Parl. Return (1857) p. 266.

Mr. Finnie permitted to act as Agent: restricted to Cotton ginned and prepared on the American principle, August.—Meantime, Mr. Finnie's request to be permitted to act as a private Agent for the purchase of Cotton, had been refused. The Madras Government expressed itself fully aware of the importance of securing a local market to the Cotton growers, but considered that Mr. Finnie as a Government servant could not engage in commercial adventures. Subsequently, however, the Madras Government discovered, that the privilege asked by Mr. Finnie had already been granted by the Bombay Government to Mr. Simpson, another American Planter, on the very ground urged by Mr. Finnie; namely, that if the Planters appeared as purchasers, their instructions would command greater attention than would be given to mere abstract recommendations. Accordingly, a similar permission was granted to Mr. Finnie, but under the same restrictions as those imposed at Bombay; namely, that the purchases should be restricted to Cotton ginned and prepared on the American principle. 139

Minutes of Consultation, 24th Feb. 1846. Parl. Return (1847) p. 421.

Minutes of Consultation, 10th Aug. 1846. Parl. Return (1857) p. 265.

Restriction removed.—Mr. Finnie appealed strongly against the restriction to ginned Cotton. He repeated all his previous objections to the use of the gin. He again stated that what was wanted was a machine like a thresher to clean the staple, before the people had separated it from 140

Mr. Finnie's letter, 28th Aug. 1846. Parl. Return (1857) p. 268.

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Minutes of Consultation, 2nd Nov. 1846. Parl. Return (1857) p. 271.

the seed by the churka. At the same time Mr. Finnie requested permission to connect himself with a house or houses of Agency, as he found it impossible for an isolated individual to trade in Cotton. Both these requests were conceded by the Madras Government; and thus Mr. Finnie was allowed to act as general Agent for the supply of Cotton, and to connect himself with any of the houses of Agency.

Dr. Wight's letter, 28th July. 1846. Parl. Return (1857) p. 266.

141 **Mr. Finnie's first year's proceedings with the Churka, Thresher, and Gin.**—Up to this point there appears to have been no breach between Dr. Wight and Mr. Finnie. Dr. Wight supplied Mr. Finnie with three saw gins,—two of twenty five saws, and one of twenty saws,—to be worked by hand. He requested that Mr. Finnie might be furnished with sufficient funds for the purchase of seed Cotton to keep his three gins at work. He even represented to the Madras Government the propriety of purchasing four or five hundred bales of the best churkaed Cotton, to be cleaned by the thresher, and then to be sent to England, in order to ascertain what the best Native Cotton would realize in the English market. Dr. Wight considered this last measure to be of the utmost importance; inasmuch as the Native dealers were so accustomed to mix the inferior qualities of Cotton with the better sorts, that very few samples of the best qualities of Indian Cotton ever reached the English market, and consequently much ignorance prevailed respecting the average prices which such Cotton would realize. Thus the permission granted to Mr. Finnie to purchase churkaed Cotton harmonized with Dr. Wight's own views. A distinction however must be made, between the authority which he received to purchase on Government account seed Cotton for ginning towards making up the 6000 bales, and the churkaed Cotton for threshing to make up the 600 bales; and the permission granted him to purchase any Cotton he pleased on private

Mr. Finnie's letter, 15th Aug. 1846. Parl. Return (1857) p. 267.

Dr. Wight's letter, 29th Sept. 1846. Parl. Return (1857) p. 337.

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account, as Agent to any merchant who might consider it expedient to engage his services. This however will be noticed further on. Meantime it will be sufficient to say that Mr. Finnie secured the thresher already alluded to. He also ordered an American hand-gin made by Mr. Idler of Philadelphia, on the ground that the gins made in America had been found to work with less labour, and to turn out nearly double the quantity of Cotton, than those made in England. Both purchases were supported by Dr. Wight, and sanctioned by the Madras Government. Nothing of course was done during the first season, as Mr. Finnie could not obtain Cotton except of the poorest quality, and moreover had no house in which to set up his gins.

Mr. Finnie's Diary, 21st Oct. 1846. Parl. Return (1857) p. 339.

Queries submitted to Mr. Finnie by the Marquis of Tweeddale.—Before entering upon the second year of Mr. Finnie's operations in Tinnevelly, it may be as well to bring forward the results of his experience in reference to the cultivation of Cotton both in America and India. Dr. Wight's Notes on American Agriculture, which he drew up at the request of Lord Elphinstone, have already been exhibited in the second Chapter. In the same way Mr. Finnie replied at considerable length to certain queries propounded by the Marquis of Tweeddale; and the results are accordingly condensed and arranged in a similar form. 142

Para 47.

Minute by the Marquis of Tweeddale, 11th Dec. 1847. Parl. Return (1857) p. 169.

MR. FINNIE'S "NOTES ON COTTON CULTIVATION IN AMERICA AND INDIA."

Early cultivation of Cotton in America: compared with the present cultivation in India.—The earliest Cotton cultivated in North America is supposed to have been brought from the Grecian Archipelago. It was first tried in Virginia, but the season between the last frost 143

Mr. Finnie's answers to the queries of the Marquis of Tweeddale;

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16th Nov. 1847. Parl. Return (1857) p. 178.

of spring and the first frost of autumn, was found to be too short to produce a profitable crop. Still however it was raised for domestic consumption, until a more favorable climate was discovered. Subsequently, the early emigrants, journeying westward from Virginia to Kentucky, carried the Cotton seed with them, but still found the climate too severe. At last it was cultivated with much success in the more southern province of Tennessee, where the summer season was slightly longer. In that early period the saw gin was unknown. The seed was separated from the Cotton in a more primitive way even than by the Indian churka, for the American people employed no machine beyond their own fingers. At that time the circumstances of the American settlers were almost analogous to those of the Indian Ryots; for the work was done when the people could employ their time in no other way. During the long winter evenings, and during bad weather, when no out door work could be performed, the Negro men and children were engaged in separating the Cotton from the seed, whilst the Negro women were employed in spinning and weaving the wool to clothe themselves and the family. Gradually the gin was introduced. One gin house was established in every neighbourhood, and ginned the Cotton for the neighbouring Farmers, whilst the owner of the gin received payment in kind. But meantime adventurous settlers had pushed still further to the South. The climate of Alabama and Mississippi was found to be even more favorable to the plant than that of Tennessee; and there every Planter soon had a gin house of his own. Thus the luxuriant South reduced the Kentucky and Tennessee Cotton to a mere domestic product; but even within Mr. Finnie's recollection, that is about 1820, the Negro men and women would gather in some neighbourhoods round a blazing fire during the long winter evenings, to hand pick the seeds out of the Cotton, which the women were to spin the next day.

Climate discovered to be of more importance than soil.—During this period of emigration, the early adventurers had discovered, as we have already seen, that as they 144
advanced towards the South, the Cotton shrub became more and more prolific, and produced a finer quality of wool. This result is to be attributed not only to the superiority of the soil, but also to the greater suitability of climate. Though soil, says Mr. Finnie, exercises much influence on the quantity and quality of the Cotton, climate is the great desideratum. A good soil in a favorable climate will produce a large quantity of fine Cotton; a poor soil in a favorable climate will produce Cotton a little inferior; but an unfavorable climate and poor soil will produce an article inferior in quality and deficient in quantity. But however rich the soil may be, no profitable crop can be produced unless the climate is propitious. These remarks refer to the climate which is essential to the production of American Cotton. As regards the climate of Southern India, Mr. Finnie believed (1847) that it produced a very good article of indigenous Cotton, which only required care and cleanliness to render it very useful and valuable. He feared however that the Indian climate was not suited to the New Orleans variety.

Nature of the lands in America on which the American plant is grown.—All land in the Southern States 145
of America on which Cotton is grown, has been cleared from forest at a comparatively late period. The Cotton does not produce a good crop in the first season after the land is cleared; the great quantity of extraneous matter causing it to grow to long watery shoots, which yield no fruit. Accordingly Indian corn is generally grown as the first crop. The land however is peculiarly suited to the Cotton plant, being a rich vegetable loam, with a deep clay subsoil; and it is moreover situated in a favorable climate.

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Manure, consisting of old stalks and rotten seed, buried in a furrow between the rows.—The land, says

146 Mr. Finnie, is manured when required. The poor old land is manured early in the spring, by running a deep furrow between the old rows, which are filled up with the old Cotton stalks; but the poorest lands have some other manure added, of which well rotted Cotton seed is found to be the best. Here America differs from India, for it produces so many better things than Cotton seeds as food for cattle, that the seeds are of no value. When the manure has thus been laid in the furrow, it is covered up by running two furrows, so that the mole laps, and forms a slight ridge over the manure; and in this state the stalks and seed are allowed to lie until the planting season, by which time they are well rotted. The advantage of this operation is two-fold: first, the land is manured; and secondly, half the ploughing is accomplished which is necessary for preparing the land for planting. The operation, as already seen, is carried out very early in the spring, before the frost has ceased to fall; and when the frost is over and all fear of it has ceased, one or two furrows are ploughed along either side of the manure ridge, which is subsequently broken up. This is done to save time, the great object being to get the seed into the ground as early as possible.

147 **Climate: very humid at night, but hot in the day.** —The climate is damp all over America, but in the Southern States it is very humid, causing heavy dews and thick fogs at night; these however are soon dispelled on the appearance of a bright sun, which usually prevails in the morning and during the whole day. The rains may be thus characterized. During spring, summer, and autumn they consist of heavy bursts of frequent showers. During the winter the climate is proverbially described as consisting of three heavy white frosts, and a hot sun in the day, which is succeeded by a heavy rain generally of one day's duration, but occasionally extending over ten days.

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Rotation of crops: alternation with Indian corn occasionally necessary.—The Cotton plant fills the land so full of its own excretions, that after a few years the ground 148
is rendered unsuitable for the reproduction of the plant in a healthy state. But Mr. Finnie doubted whether the continued crops exhausted the soil; for if the lands, said to be exhausted, were planted for one year with Indian corn, they would produce a fine crop of the corn, and the next year would be again fitted for the production of Cotton.

Capital required in American cultivation.—Any 149
sum from 20,000 dollars to 200,000 might be invested in an estate. The first amount would yield a handsome profit, provided it were well managed by the owner himself; though it would not justify the employment of a Superintendent. But 200,000 dollars well laid out, made a handsome property; and was as much as one Superintendent, whether owner or employer, could look after in detail, with the assistance of his Negro drivers. There were many Planters however, who owned several such estates; and the details of each were Para. 175.
conducted by a Superintendent, whose reputation was revolved in its success or failure, that is in the profit or loss of the estate entrusted to his charge.

Successive operations necessary to raise a crop: cleaning old land and clearing new.—In America, says 150
Mr. Finnie, the life of a Cotton Planter is one of incessant labour. In the first place, great care is necessary to ensure a good and regular stand of plants; and secondly, in the gathering season, constant attention is necessary to ensure the cleanliness of the Cotton: but when the hands employed have been once brought under strict discipline, they give but little further trouble to the Planter. The operations of the year may be thus described. The week's holiday, which is annually granted to the Negroes, is over by the 1st of January. The first operations of the Planter are to clean and

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prepare his old land, and to clear a piece of new. On the old land, advantage is taken of every interval of fine weather, for a few steady ploughmen to run the manure furrow already described between the old Cotton rows; while women and children follow them, and beat down the old stalks and lay them in the furrow. If necessary, the carts follow with the manure, and then the ploughs again run over the land to cover up the manure at once. On the new land, the trees are cut down for fences, whilst the under grown and thick canes are cut flat to the ground, and when sufficiently dry, are set on fire and burnt off clean. Before the embers are cold, this new land is planted with Indian corn; because the latter is not so delicate as Cotton, and is not killed by the frost. The three agricultural operations of planting, scraping, and gathering, may now be described in their natural order.

151 **Planting.**—The planting season lasts from the first to the thirteenth of April. The first of April is the great commencing day, and then every available "plough team" is put in harness, and often the carriage horses are pressed into the service of the plough. A few additional furrows are thrown to the slight manure ridge already mentioned, in order that the closing furrow may drain the surplus spring showers. Next follows the drill, which opens the ridge; whilst an active woman keeps pace with the horse, and sows the seed in a beautiful straight line in the little furrow opened by the drill. The interval between the plants varies according to the poorness or richness of the soil. In poor land the Cotton is planted close together, but in rich lands wide apart, thus reversing the order of grain husbandry. Accordingly, the plants are sown in rows from four to eight feet apart, varying according to the quality of the land; and the seed is left in the drill in corresponding intervals of from six to twelve inches, or even of fifteen inches where the land

is very rich. In India three inches in the drill, and two feet between the rows, is sufficient in the best lands. After sowing, the harrow follows immediately, and lightly covers the seed; and this operation brings the work of the planting season to a close. Here it may be remarked, that one steady ploughman with his horse and drill; one woman to sow the seed, with a little boy to wait on her and supply the seed; and a large boy with his harrow drawn by a horse;—will altogether plant ten acres per diem.

"Scraping" or hoeing.—The scraping season commences 152
immediately after the plants are above ground. This operation is very important, as the success of the crop mainly depends upon the neatness and accuracy of the scraping. The great point is to secure a good stand of plants; that is to leave the plants in regular intervals, and proportioned in width to the poorness or strength of the land. To achieve this object a few careful Negro drivers give their whole care and attention to it, following the hoemen to see that neither too much nor too little is taken away. The Cotton as it comes up stands thick in the drill. The hoe is passed through the mass of plants, and cuts away in width as the hoeman is directed by the driver, leaving two plants in a place, thus : : : : : :
If both the plants live, one of them is pulled out at the next hoeing. A ploughman follows these scrapers or hoemen, and runs a slight furrow on both sides of each Cotton row, throwing a little dirt gently among the plants, to replace that which had been taken away by the hoe. Alternate ploughing and hoeing thus continue in rapid succession, each round occupying from fifteen to twenty days, until at length the pods begin to open. During this period, time can scarcely be found to gather the "fodder" from the Indian corn, or even to obtain the grain when it has at last ripened.

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153 **Gathering.**—The gathering season commences about the middle of July, when only a few of the first formed bolls begin to open. Before however these have been gathered from the whole plantation, the beautiful snow white tufts of vegetable wool begin to appear, thickly interspersed amongst the deep green and yellow flowers. From that time until Christmas there is no cessation of labour. Six days in the week from daylight to dark the hands are in the field, except when they are interrupted by rain, which is always injurious during the picking season, when dry weather is most desired. Every evening the day's gathering is weighed to see that each hand has done its duty ; every hand being expected to pick from 150 to 250 lbs. per diem, averaging in fine weather about 200 lbs. ; a result which strangely contrasts with similar work in India, where Mr. Finnie never heard of a hand gathering exceeding fifteen pounds, and where from seven to ten pounds is the usual day's work. After the weighing of the day's gathering, the Cotton is carried in waggons to the gin-house, and the day's work is over. Next day the Cotton is spread out on plank scaffolds to dry ; and a few superannuated Negroes pick it over, and take out the trash that may have accidentally got mixed with it. Thus the seed Cotton goes to the gin almost free from trash, and consequently comes out clean.

154 **Uncertainty of weather : average crops.**—As regards the general failure of a Cotton crop, Mr. Finnie says that he had never known of such a case in America. Every year the speculators who have a stock to sell get up a cry of failure ; whilst those who wish to buy exaggerate the probable produce of the season in order to lessen the price. The reason why there never is a general failure seems to be as follows. Poor and rich lands are interspersed through the whole country, except immediately on the river ; and whilst the poor lands produce the finest crops in a wet season, the new rich hill lands, and all river bottom lands, produce the

best crops in a dry season, or rather in what the Americans would call a dry season. In estimating the climate however, it is necessary to bear in mind that the Americans plant their Cotton in the spring, at a time when lands in general have been saturated by all the winter rains, and when it is often difficult to get the ground dry enough to plant nicely. Again, after sowing, a good rain is essential to a perfect stand of plants; and indeed during the planting season, it usually falls at intervals of a few days. If no rain falls on the newly sown field, the plants come up irregularly. Again, if a very heavy rain falls on the newly sown Cotton, and a hot sun follows immediately afterwards; then, if the ground be old and clayey, it bakes over the seed, and becomes so hard that the plant cannot make its way through it; and a light wooden tooth arrow is often run over it to break the crust, and thus to let the young plants appear above ground. But as regards weather the Planter is a proverbial grumbler. It is always too dry or too wet. If he does not get rain every six or eight days during the whole ploughing and hoeing season, he grumbles, and frets, and loses all patience at seeing his "hands" working to so great a disadvantage in the hard land; wearing out his hoes, wearing out the files for keeping the hoes sharp, and obliging his blacksmiths to be always employed in keeping the ploughs in order. Then the Planter in the old hills or uplands is raving because his plants do not grow in dry weather; whilst his neighbour on the river "bottoms" is raving because his plants grow too fast in wet weather. Thus the crop is always pretty regular, except when attacked by the bug or caterpillar; but this casualty seldom happens. The usual rough estimate of an average crop, is a bale of 400 lbs. of clean Cotton per acre; the seed Cotton yielding from 30 to 31 per cent. of clean Cotton. Mr. Finnie considered that some lands might produce such a crop; but he was inclined to estimate the average at about 300 lbs of clean Cotton per acre.

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155 **Expenses of Cotton cultivation: produce estimated, not at so much per acre, but at four to eight bales per Negro.**—According to Mr. Finnie, it is impossible to calculate in detail the expenses of cultivating one acre of Cotton; because there are slaves employed, who receive no wages, and who are also employed in cultivating other things beside Cotton. The produce is always roughly estimated at so many bales to the "hand," varying from four to eight, according to the ability of the Planter and the season. This estimate is exclusive of the other things produced for home consumption. All thrifty Planters produce all their coarse supplies, such as bread, meat, vegetables, and similar articles for the Negroes food. Formerly the Negroes clothing was also made at home; but now the machinery has long supplanted the hand-wheel. Altogether the planter now (1847) does not realize above eight per cent. for his money; but then he lives on the produce of the estate, with the exception of such luxuries as his habits and tastes require.

156 **Machinery, Gin-house, Gins, Press, and Drawing Machinery.**—The expense of American machinery per acre, cannot be calculated any more than the expense of cultivation. The following machinery must be purchased by the Planter, whether he produces one hundred bales of Cotton, or six hundred; excepting perhaps that he might produce the former with one gin only, whereas he would require two gins to produce the latter.

	Dollars.
Gin-house........................from 2,000 to.........	2,500
Two Gins... ....from 350 to 400 each, say	700
Single Iron Screw Press ...... from 500 to..........	550
Driving machinery fitted up ... from 500 to.........	600
Total Dollars...	4,350

But the mode of procedure in America is so different from that in India, that the most exact estimate in detail of a gin-house and the necessary machinery, would afford no criterion for the arrangements which would prove most beneficial in the latter country. Here in India it will be necessary to give the people something more simple than the gin and large gin houses for their own use in cleaning their own Cotton. In fact the seeds of the Indian Cotton are so small, that if the grates of the gin are placed close enough together to prevent the seed from passing through, the saws bring the Cotton so much in contact with the bars, as to cut it to a degree that much injures the staple. Accordingly, Mr. Finnie considered that the American gin was only suited to the American Cotton; that the two must go hand in hand; and where the American Cotton failed, the gin would prove useless.

Price of Land: fluctuates with the price of Cotton. 157
—The rent of land in southern America, as part of the cost of producing Cotton, could not be estimated by Mr. Finnie. In the Southern States, he said, every Planter is a Landlord, from the squatter with his small section, to the capitalist with his twenty-thousand acres. Land rent is thus unknown, and the value of an estate is never calculated so closely. A Planter who is compelled to sell, takes what his neighbours are disposed to give him. Sometimes a wealthy neighbour will offer a very high price for a good plantation in his immediate neighbourhood, because he wants it for an especial object. Again, it is very often the case that three-fourths, and sometimes seven-eighths of an estate, are uncleared forest; and consequently the whole value cannot be estimated according to the produce of that which is under culture. In a word, land in the Southern States has no fixed value, but seems to fluctuate with the price of Cotton.

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158 **Minimum price at which American Cotton could be produced, four pence per pound.**—As an illustration of the cost at which Cotton was produced in America, Mr. Finnie furnished the following interesting data. "Sometime about 1840, when the question of a Cotton supply from India was seriously agitated, a meeting was called of the most intelligent and distinguished Planters, in order to determine upon the best method of counteracting the efforts which were being made in that direction. It was then decided that so long as the American Planters could get eight cents (4*d.*) per lb. for their Cotton, delivered at the nearest market, they could afford to produce it; but that if a supply from any other quarter could be obtained for less than that sum, they must then turn their attention to the cultivation of other commodities. Thus by adding 1*d.* per lb., to the 4*d.* for expenses to England, we have the minimum price, 5*d.* per lb., at which it is said America can produce the article. All therefore that remained to be done in India, was the production of an article of an equal quality but at less cost.

159 **Prospects of India: labour in America and India compared.**—Mr. Finnie believed that the consumption of Cotton would increase in the same ratio as the production; that under any circumstances all good American Cotton, and all good Indian Cotton, would ever find a market. America could not be easily supplanted, whilst she retained all her advantages of enterprise, industry, climate, soil, rivers, steam-boats, and rail-roads. On the other hand, India possessed a territory, that would produce a pretty good article of "New Orleans Cotton," and that was equal in extent to the whole Cotton growing region in America; but then to render the cultivation successful, the people must carry it on themselves. Here however, in the matter of cheap labour, India possessed a decided advantage. The interest of the

money invested in the purchase of a labourer in America, added to the actual cost of his maintenance, would pay for nine able-bodied men in India. It was true that the American labourer, as one of many, not only provided for the comfort of his master, and supported himself, but he actually enriched his master; whilst the nine Indian labourers would not produce enough, in their capacity of servants to the European, to pay their own wages, to say nothing of paying the land-rent and affording a profit to their employer. But still, if the people of India could only be induced to undertake themselves the improved cultivation of the American Cotton, the advantages they possessed in numerical strength, and in the trifling cost at which they could be supported, more than counterbalanced the advantages possessed by America in the shape of greater quantity of Cotton produced per acre and a finer quality of Cotton wool.

Reduction of the Indian land-tax on Cotton grounds would neither benefit the Ryot nor extend the culture.—As regarded the land tax in India, or Government assessment upon the lands, Mr. Finnie said that there was no land tax in America. At the same time he expressed an opinion that a general reduction or abolition of the land tax on Cotton grounds, would neither benefit the Ryots nor extend the culture of American Cotton. There might be individual cases where the land-tax was oppressive, and where the load ought to be removed; but a general reduction would effect nothing. At present the Ryot goes into debt to the extent of his means; if his means are increased, his credit is increased in a like ratio; and he avails himself of his credit to the fullest extent, and his banker reaps the benefit. Therefore, if Government did not collect a pice of revenue, the "poor oppressed Indian Ryot" might cease to be the theme of declaimers and grievance mongers, but he 160

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would be the "poor oppressed Indian Ryot" still. The only difference would be, that he would change his European master who had tried to deal fairly with him, for a ruthless monied fellow countryman, whose sense of justice would not be very acute.

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161 **Mr. Finnie's Second Season, 1846-47: planting operations succeeded at Courtallum but failed at Sevacausey.**—To return to the narrative of Mr. Finnie's proceedings in Tinnevelly. At the commencement of the second season he planted some New Orleans Cotton at Courtallum, which enjoyed the benefit of both monsoons, and also at Sevacausey, which enjoyed the benefit of only the North-east monsoon. The results are not given in any detail. At Courtallum only a small quantity was planted; but though the land was bad, and the cultivation was much neglected by the people who undertook it, yet the crop proved to be of a fine quality, and under the circumstances produced a good return. At Sevacausey the result was different Not a plant lived through the long drought which generally prevailed, excepting those which had been sown on one small field, that had been cultivated and irrigated by a Ryot of intelligence and zeal. This field yielded a crop of American Cotton which was much liked by the people, and they expressed a willingness to plant it again the next year. Accordingly Mr. Finnie distributed seed, and agreed to take the produce in seed Cotton before separation, at two rupees per podhee of 280 lbs. above the market value of the Native article. This purchase is said to have been insisted upon, because the Ryots had found that they could not separate the staple from the seed by their own rude churka; thus rendering it necessary that all American Cotton should be separated by the American gin. The result properly belongs to the proceedings of the next season; but it will perhaps be sufficient to say that this crop also proved an utter failure.

Mr. Finnie's letters 24th April and 24th Sept. 1847. Parl. Return (1857) p. 273 and 279.

Mr. Finnie's letter, 18th March 1848. Parl. Return (1857) p. 364.

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Mr. Finnie is disappointed as an Agent: proposal to employ Government Funds.—The Agency operations of Mr. Finnie during the second season were just as disappointing as his planting operations. He found that the Merchants of Madras and Ceylon had already established their own Agents in Tinnevelly, and that consequently he must look to other Cotton trading ports for that co-operation from the merchant, which was indispensable to his success. Moreover, in consequence of the delay of nearly a year in granting him permission to act as Agent, the gathering season for 1846-47 was so near at hand, that he feared he should not be able to establish a business connexion in time to accomplish much by that year's Agency. Accordingly he proposed that beside erecting the gin house, and setting up the machinery, Government should place a sum of money at his disposal. With this money he would purchase Cotton, and ship it to a mercantile firm in England, in order that it might be sold, and the amount of sales be rendered to him direct. By these means he would be in possession of every item of the expense, and would thus be enabled to draw up an annual statement of profit and loss, for the information of Government and of all parties interested in the question. If the Government could not comply with this request, he was prepared to clean and ship Cotton on his own account to the extent of 30,000 rupees, provided that Government would let him have that amount upon the security of Government paper, without charging him any interest on the loan. This proposition fell to the ground, as the Government declined to advance money to Mr. Finnie for the purchase of Cotton on his own account. 162

Mr. Finnie's letter, 16th Dec. 1846. Parl. Return (1857) p. 346.

Minutes of Consultation, 8th Feb. 1847. Parl. Return (1857) p. 350.

Mr. Finnie's second year's operations with the churka, thresher, and gin.—At the commencement of this second season, Mr. Finnie expressed himself still anxious to gin a quantity of Cotton towards completing the Com- 163

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pany's order for six thousand bales. For this object, a gin house was necessary in which to work his gins, and to obtain this was a work of time. Meanwhile he had a second object in view; namely, to induce the Natives to engage in the business. Accordingly it will be advisable to review, first, his efforts to persuade the Natives to use the gin; and secondly, his efforts to obtain a house for the working of the gins.

164 **Sale of two gins to neighbouring Zemindars: their failure.**—As regards the former measure, he appeared in the first instance to have achieved a great success. He had actually prevailed on two Zemindars of villages to purchase each a gin; he, on his part, agreeing to take all the Cotton they ginned at a fair price. The gins were set up in houses not exactly fitted for them; but still the experiment was tried, and Mr. Finnie had the pleasure of subsequently reporting that the gins were a failure. Their working he said, was both imperfect and expensive. The saw wheels did not project sufficiently through the grates, and the staple was only partially separated from the seed. Again the gins moved so heavily, that the people employed to work them, refused to turn the wheel after the second day. Mr. Finnie thought that coercion might do them good, but remembered that they were free men. Next he thought of employing cattle labour, as we shall presently see. At a later period however, he discovered that the coolies had been either forced to work, or had been only half paid. Consequently their inability had been assumed.

Mr. Finnie's Diary, 21st Oct. 1846. Parl. Return (1857) p. 339. Mr. Finnie's letter, 25th Oct. 1846. Parl. Return (1857) p. 369.

165 **Cotton Brokers rather than Zemindars should be induced to adopt the gin.**—Mr. Finnie then expressed the opinion that Cotton Brokers rather than Zemindars, should be induced to adopt the gin. The two Zemindars who had bought the gins paid little attention to business,

Mr. Finnie's letter, 16th Dec. 1846. Parl. Return (1857) p. 346.

and committed the work to some of their numerous dependents; and the latter were ever ready to peculate, by charging heavy expenses to the working of the new machine, and appropriating the surplus over the actual expenditure to their private uses. Consequently, the profits whether large or small were all absorbed. Mr. Finnie however had found that a class of men, known as Cotton Brokers, were settled in all the large towns in the best Cotton districts; and that it was the business of these men to purchase seed Cotton, to separate the seed from the wool, and then to sell both seed and wool separately. These men of course looked after their own affairs, inasmuch as their profits were derived from their own transactions. Accordingly, Mr. Finnie considered that the Brokers ought to be induced to adopt the gin as the best mode of separating the fibre from the seed; and that therefore it would be necessary to convince them of its advantages by experiments conducted on the most economical scale.

Mr. Finnie's proposals for erecting a Gin House and Cattle Driving Machinery in Tinnevelly.— 166
Meantime,—that is in October 1846,—Mr. Finnie had formed the design of erecting a Gin house and Driving Machinery in Tinnevelly, for the purpose of working his gins by Cattle instead of by manual labour. In a word, he desired to set up in Tinnevelly an establishment similar to that of Dr. Wight in Coimbatore. He accordingly made the following proposals. 1st. To erect a cheap house, in which either the gin or the thresher might be worked as circumstances required; and which would give such a permanence to the business, as would engage the confidence of the Natives around. 2nd. To purchase a set of new driving machinery which was for sale at Jaffna in Ceylon at the price of £155. Both these two propositions subsequently underwent some extraordinary transformations. The second

Mr. Finnie's Diary, 21st Oct. 1846. Parl. Return (1857) p. 339.

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however involved the relative merits of cattle labour and manual labour, and therefore may be first discussed.

167 **Purchase of Cattle Driving Machinery sanctioned: relative cost of cattle labour and manual labour.**—Mr. Finnie's proposal for the purchase of the Cattle Driving Machinery, was strongly supported by Dr. Wight, and accordingly sanctioned by the Madras Government. There was some discussion about the locality, but finally the village of Sevacausey was chosen in the district of Tinnevelly, as being the centre of an extensive Cotton growing country, and also as containing many establishments for separating the Cotton staple from the seed with the Madras churka. As regarded cattle labour and manual labour, Dr. Wight had already tried both methods in Coimbatore. For the first three seasons he had worked his gins by hand labour, the coolies contracting to gin so many maunds of seed Cotton for a certain sum. Subsequently he had employed cattle labour, and then he had discovered that cattle labour in ginning was more expensive than coolie labour. But still Dr. Wight strongly urged that the experiment should be tried, as coolies might be dearer in Tinnevelly than they had proved to be in Coimbatore.

Dr. Wight's letter, 11th Nov. 1846. Parl. Return (1857) p. 338.

Mr. Finnie's Diary, 21st Oct. 1846. Parl. Return (1857) p. 339. Mr. Finnie's letter, 16th Dec. 1846. Ibid p. 347.

Dr. Wight's letter, 11th Nov. 1846. Parl. Return (1857) p. 338.

168 **Change in Mr. Finnie's views as regards the Cattle Driving Machinery.**—By this time Mr. Finnie's mind had undergone an apparently unaccountable change. The proposal for purchasing the driving machinery had been made in October 1846. In November it had been forwarded to Government with the recommendation of Dr. Wight; and on the 2nd January 1847, the purchase had received the necessary sanction. On the 13th January, Mr. Finnie acknowledged the receipt of the authority to purchase, but stated that he had changed his mind as to the expediency of employing cattle labour, and was considering whether by lessening the friction of the gins, they could not be driven best by ma-

Mr. Finnie's letter, 13th Jan. 1847. Parl. Return (1857) p. 350.

nual labour. He therefore requested that the purchase might be postponed. Dr. Wight seems to have been somewhat irritated by this sudden change in the mind of Mr. Finnie. He stated that the purchase of the machinery had been fairly completed; and that without such machinery, it would be impossible to complete the Court's order for six thousand bales. He therefore urged that a house should be procured, and that the cattle driving machinery should be fitted up at once: that two large gins, of sixty saw wheels each, should be worked by the cattle machinery at one end of the lint room; whilst three or four smaller gins, of twenty and twenty-five saws each, should be worked by coolies at the other end of the room. The result was that the Madras Government ordered the purchase money for the driving machinery to be paid. At the same time, Mr. Finnie was called upon to state what he now intended to do with the machinery, and what arrangements he had made for driving his gins by manual labour. His attention was also drawn to a recent despatch from the Court of Directors, stating that the Manchester Association objected to the use of hand gins.

Dr. Wight's letter, 18th Jan. 1848. Parl. Return (1857) p. 348.

See para 171.

Minutes of Consultation, 24th April 1847. Parl. Return (1857) p. 354.

169 **Mr. Finnie's explanation of his apparent inconsistencies.**—Mr. Finnie's explanation of the causes which led him to advise the purchase, may be given in a few words. The Ceylon machinery had been recommended to him by both Dr. Wight and Mr. Petrie as early as February 1846; but being anxious to conduct his operations on the most economical plan, he had not concurred in their views. Subsequently, he had found greater difficulty than he had anticipated in working the gins on the two Zemindaries by manual labour; and had consequently formed a poor opinion of the physical ability of the people. At the same time, whilst strongly opposed to the use of the gin, he felt that it ought not to be rejected on insufficient data. Ac-

Mr. Finnie's letter, 29th May 1847. Parl. Return] (1857) p. 355.

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cordingly, though he had represented that ginning operations were impracticable as a mercantile transaction, yet he had recommended the purchase of the driving machinery, in order that no efforts on his part might be left untried for giving the experiment a fair trial. His reasons for subsequently opposing the purchase were as follows. 1st. Mr. Petrie had so far altered the gins, as to remove some of the greatest difficulties in the way of a successful application of manual labour. 2nd. He found that the coolies who worked for the Zemindars were either forced or only half paid; and that when Mr. Petrie's improvements had been effected, the people were both able and willing to work, provided they were paid. 3rd. Hand gins were new to him, as they were never used in Mississippi; but after giving further attention to the subject, he had resolved on a plan which would give greater efficiency to manual labour. 4th. He had calculated the extraordinary expenses of driving machinery, such as the cost of the machinery itself, the cost of transportation across the Gulf, the cost of transit to the gin house up country, the cost of erection, and, last but not least, the cost of keeping up an establishment of bullocks all the year round merely to work during the Cotton season. 5th. He considered that the driving machinery had been made to go at a certain speed when drawn by horses walking about four miles an hour; and that the gins would consequently move too slowly when drawn by bullocks whose speed would not exceed two miles an hour. The general question however appeared to be partly settled by the Manchester Association, who had expressed a decided preference for the gins moved by cattle machinery over the gins moved by hand. But, notwithstanding this authority, Mr. Finnie still believed that the experiment which was about to be conducted, would test the relative merits of cattle gins and hand gins; and would thus prove more satisfactory to the merchants and manufacturers, than if conducted with the cattle machinery

alone. The President of the Association had indeed said that the hand gins should not be used until their efficiency had been more fully proved; but how was their efficiency to be proved excepting by their being used?

Mr. Finnie's general objections to the Gin discussed by Dr. Wight.—Whilst this discussion had been carried on about the driving machinery, another discussion had been going on about the gin generally. Mr. Finnie's views have already been exhibited. He considered that the gin was unfit for Indian Cotton, and that the churka was unfit for American Cotton. Again, he had urged that the expense of the gin was sufficient to deter the Ryot from using it. His arguments upon this point were referred to Dr. Wight, and the latter dealt with them thus. The whole question of gin *versus* churka, depends upon whether ginned Cotton will fetch a higher price in the English market than churkaed Cotton; and that question is in a fair way of being solved by the experiment in progress, of sending home 6000 bales of ginned Cotton and 600 bales of churkaed Cotton, to ascertain the relative prices which they would fetch in Manchester. When the relative selling prices have been ascertained, it will be easy to discuss the question of relative cost prices. Thus Mr. Finnie had stated that the Ryot might lose four rupees per candy on ginned Cotton more than on churkaed Cotton; but then if ginned Cotton would only fetch one farthing per pound more than the other, the merchant would be able to pay that four rupees per candy, and yet secure a still larger profit for himself. On the other hand, should the gin be found to injure the staple of Native Cotton, it would be soon discarded. Similar opinions were expressed by Mr. Petrie, the Engineer employed in Coimbatore to keep the gins in repair. If the ginned "East India Cotton" fetched a higher price in the English market, then the gin would most assuredly force its way into India; just 170

Paras 130, 131.

Para 161.

Dr. Wight's letter, 7th Dec. 1846. Parl. Return (1857) p. 345.

Para 130.

Mr. Petrie's letter, 7th December 1846. Parl. Return (1857) p. 345.

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as machinery for shortening labour, or for cheapening it, or for doing it better, had forced its way into other countries, even when it had proved a temporary hardship to the masses.

171 **Mr. Finnie's proposition for erecting a Gin-house of two stories: the lower one for the Driving Machinery, and the upper one for the Gins.**—But to proceed with the narrative. It had now been finally arranged that the cattle driving machinery should be tried with the large saw gins, and that manual labour should be tried with the smaller gins. Accordingly it was absolutely necessary that a gin-house should be constructed for their reception. Mr. Finnie had for some time been anxious to erect a gin-house. He now proposed that this house should be about 78 feet long by 24 feet broad; that it should contain six rooms, three on the ground and three on the upper floor; that the room in the middle of the ground floor, and the one in the middle of the upper floor, should each be 30 feet long by 20 broad in the inside; and that the four end rooms on the ground floor and upper floor should be each 20 feet long by 20 broad.* These two stories of three rooms each, were thus to be appropriated. The upper story was intended for the gins, and the ground floor for the driving machinery and storing of the Cotton, according to the following arrangement. On the upper story, the two end rooms were to be appropriated to the gins, which would discharge their Cotton into the centre room between them, which was to be called the "lint room." On the ground floor, the centre room was to be occupied by the wheels belonging to the driving machinery, whilst the two end rooms were to be used as

Mr. Finnie's letter, 1st Dec. 1846. Parl. Return (1857) p. 343. Compare his letters, 16th Dec. 1846. and 29th March 1847. Ibid p. 346 & 360.

* This would seem to give a measurement for the whole house of 70 feet long and 20 feet broad, instead of 78 long and 24 feet broad as above indicated. But the difference is accounted for by the thickness of the walls.

store rooms. The wheels in the lower room would be connected with the gins in the upper rooms by a single band passing through the wall and floor, at an angle of about forty-five degrees. By this plan the gin would receive the compound motion it required. The saw cylinder and the brush wheel revolve in opposite directions; the brush wheel with an accelerated motion of about five revolutions to one revolution of the saw cylinder, which is effected by proportioning the size of the cylinder and brush wheels. The great desideratum in India was to drive both with one band. This object Mr. Finnie proposed to effect by passing the under part of the band over the brush wheel, and thus driving it in an opposite direction to that in which it drives the cylinder. After some little discussion, the erection of the gin house at Sevacausey on the above plan was finally sanctioned at a cost of 2699 rupees.

Minutes of Consultation, 15th Sept. 1847. Parl. Return (1857) p. 364.

Hire of a temporary Gin-house at Aroopoocottah. 172
—The discussions about the driving machinery and gin-house had commenced about the latter end of 1846, but sanction for the erection of the gin-house was not obtained until September 1847. Meantime the gathering season for 1847 had passed away. Mr. Finnie however had not suffered the time to be lost without some show of effort. He had three hand-gins in his possession, two of twenty-five saw wheels, and one of twenty saw wheels; and he professed to be still anxious to assist Dr. Wight in completing the Court's order for six thousand bales. Accordingly, about the commencement of the gathering season, he induced the Head man at Aroopoocottah to rent him a house at seven rupees (14*s.*) a month, and a godown at three rupees (6*s.*) a month, for the purpose of ginning Cotton to complete the Court's order.

Mr. Finnie's letter, 23rd Sept. 1847. Parl. Return (1857) p. 279.

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173 **Erection of three gins and a thresher: their effect upon the Natives.**—Having made the necessary alterations in the hired house, Mr. Finnie erected two 25 saw gins, one 20 saw gin, and one thresher; and then invited the Cotton Brokers, Chitties, and Ryots to visit the scene of his operations. Accordingly they came in crowds. He showed them the advantages of the gin over the churka; and they all appeared delighted at seeing the gin separate the staple from the seed, and the Cotton come out so nice and clean. He also showed them how the thresher separated so much dirt from the Cotton. Still however they required time to consider the propriety of adopting so new and wonderful an implement. From what Mr. Finnie could learn, they appeared to reason thus:—"Here is a gentleman who is come amongst us, and who proposes to trade in Cotton like ourselves. He brings machines which are new to us, and which evidently clean the Cotton beautifully; and he generously offers, either to let us have the machines, or to work them himself in cleaning our Cotton. That the Cotton he produces is superior to our own cannot be doubted; and it will certainly rule the market to such an extent, that whilst he will dispose of his superior article to the European merchants, we shall be totally unable to dispose of our inferior and dirty commodity. Under such circumstances we shall have no alternative, but to adopt the gin, or lose the trade by which we make our bread. One point however still remains to be ascertained. The ginned Cotton is evidently superior, and ought to bear a much higher price; but will this increased value be sufficient to pay us for our additional trouble?"

174 **Testimony of the Brokers that dirty Cotton was more profitable than clean Cotton.**—A deputation of Cotton Brokers next waited on Mr. Finnie, to learn how much they were likely to get for Cotton cleaned by the gin,

and if there was a market for the ginned article. Hitherto, they said, they had found the dirty Cotton sell almost as readily as clean Cotton, with but a very trifling difference in the price; and certainly the dirty Cotton was more profitable than the best and cleanest article they could get. The ginned Cotton, they admitted, was certainly superior to their own churkaed Cotton; but then they always engaged to deliver their Cotton with the dirt in it, and if that dirt were removed by the thresher and gins, then it would have to be made up with additional Cotton; and unless a much higher price could be obtained for the ginned article, they would be absolute losers by the improvement. Mr. Finnie considered that this argument was conclusive. Dr. Wight had already stated that ginned Cotton only brought in England one farthing more per pound than the common churkaed Cotton; and the loss in dirt alone amounted nearly to that sum. Mr. Finnie admitted that the use of the gin was merely a question of profit and loss. If the Natives could realize a profit by it, they would adopt it at once. Its success therefore rested solely upon the willingness of the merchant and manufacturer to pay a higher price for the improved article. Hitherto the men in England, who had been loudest in their cry for clean Cotton, had been only anxious to secure all the advantage for themselves, and to take the clean Cotton from the poor Ryot, at the same price as they had hitherto given for the dirty article.

Para 170.

MR. FINNIE'S NOTES ON THE PECULIARITIES OF THE COTTON TRADE IN TINNEVELLY.

Systematic adulteration of Indian Cotton: transactions between the Ryots, the Brokers, the Chitties, and the European Agent.—In order to explain the causes of the systematic adulteration of Cotton, Mr. Finnie entered at considerable length upon the manner in which the Indian Cotton trade was conducted. The results may 175

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be thus exhibited. The Ryot, is the planter who cultivates the Cotton. The Broker is the Cotton cleaner, who takes the Cotton from the Ryot and delivers it to the Chitty. Again the Chitty is both merchant and banker:—a merchant so far as he contracts with the European Agents on the coast for the delivery of so much Cotton at a certain price; and a banker so far as he makes advances to the Broker, who again makes advances to the Ryot, for the purpose of securing the Cotton crop when it is ready for delivery.

176 **The Ryot: improvident and helplessly in debt.**—The Ryot produces the Cotton of the country. He is always as deep in the Broker's books, as his credit will permit; and consequently cannot stir without an advance from the Broker on the security of the coming crop. Accordingly the Broker first obtains an advance from the Chitty, who is the monied man in all these transactions; and then advances to the Ryot. The Broker however must look sharply after the Ryot, and see that he really does plant his land with sufficient Cotton to meet his engagements; otherwise the Ryot, with his usual reckless improvidence, would spend all the money in a big feast, or wedding, or nautch dance, or some other sort of "tumasha."

177 **The Broker: adulteration of the Cotton by the "Devil's dust" system.**—The Cotton crop is delivered to the Broker whilst it is still in seed. The Broker is particular in classifying the seed Cotton, and pays the Ryot for it according to its cleanliness. Next he has much of the trash and rotten locks picked out; not to make the Cotton better, but because the rubbish chokes the churka, and prevents it from working. The good Cotton staple is then separated from the seed. After this is done the adulteration commences; for the Chitty contracts so closely with the Broker, that the latter is compelled to resort to what is called the "Devil's dust" system, in order to secure

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a living profit. This system may be thus described. The rotten Cotton seed, which had been thrown on one side lest it should choke the churka, is beaten with a stone to loosen the fibre from the seed, and then passed through the churka. Then the good Cotton and the bad Cotton are both taken into a little room six feet by six, which is entered by a low door about a foot and a half high and two feet wide, and ventilated at a little hole through the outer wall. The object in view is to thoroughly mix the good and bad fibre together. Accordingly, two men go into this little dungeon, with a bundle of long smooth rods in each hand. Each man ties a cloth over his mouth and nose, to prevent his inhaling the flying fibres of Cotton; and one man places his back against the little door so as to prevent any waste. Then they both set to work and whip the Cotton with their rods, in order to mix the bad and good so thoroughly together that a very tolerable article is turned out. If, after all this "bedevilling," the Broker can get a living price for his article, he delivers it to the Chitty just as it is, with the addition of only a few seeds. Usually however, he is shaved so close as to be driven to resort to other means to realize a profit. Accordingly he adds a handful or two of seed to every bundle, or lets it get in by accident; and in this state the Cotton is finally delivered to the Chitty.*

The Chitty: tricks played with the European 178
Agents.—Nothing now remained but for the Chitty to pass off the Cotton upon the European Agent at the Coast. It is usually the custom for the Chitty to make a contract with

* A curious instance of adulteration is recorded by Dr. Wight. On one occasion he had several bales of damaged American Cotton, which he did not think worth the cost of sending home; and accordingly he offered it for sale in Coimbatore. To his surprise the Cotton was immediately purchased at the high figure of fifty rupees per candy. Subsequently he learnt that this American Cotton was purchased for the purpose of mixing it with some inferior very short stapled Native Cotton; its long staple enabling the dealer to pass off the whole at full prices as Cotton of the first sort. Parl. Return (1857) p. 295.

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his European Agent, before he himself makes his contract with the Broker. The contract is made for such a quantity of Cotton of such a quality; and of course the very lowest sum is fixed. The Chitty agrees to the contract; knowing that the price fixed is insufficient to secure the quality contracted for; but knowing also that when the time for delivery arrives, the Agent must take just what he, the Chitty, chooses to deliver. In other words, the Chitty knows that the European Agents have their engagements to meet; that they have made all their arrangements for shipment; and that perhaps they have a ship waiting, and presses lying idle. Under such circumstances he delivers his Cotton to the Agent, who has merely to receive it. The Agent examines the Cotton by plucking out a handful and letting the bundle pass. Perhaps, from caprice or ill humour, he rejects a bundle just as good as those he has taken. Then the Chitty gets angry, and orders his people to stop delivering, as the gentleman will not take the Cotton. The Agent then takes the rejected bundle to induce the Chitty to proceed with the delivery. All however depends upon the state of the market. If it is brisk, and the Chitty finds that other Agents are in want of Cotton to make remittances with, he stops all rejection of inferior bundles, by threatening to throw up the contract; and then the Agent, or rather the young man employed by the Agent to receive the Cotton, is compelled to soften his tone, and to entreat the great Chitty to let him have the Cotton, as his employers will find fault with him if he does not get on with the shipment. If, on the contrary, the market is dull, the Chitty is not quite so independent. Some Cotton is rejected in bulk, and finally put on one side. But still the Chitty is prepared even for this emergency. Within a day or two the Cotton is loaded on the bandies, and marched round the town; and then comes in fresh from the country, and is all taken as a very good article. The consequence of all these proceedings is,

that the English manufacturer will only give a low price for Indian Cotton, because he never knows what he is buying, nor what quality of Cotton will be found in the bales, nor whether the staple will be dirty or clean.

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Conclusion of the season of 1846-47: difficulties in the way of conducting the ginning operations at Aroopoocottah.—Notwithstanding Mr. Finnie had secured a temporary gin house in good working order at Aroopoocottah, he had still to contend, according to his own account, with two great difficulties. 1st. He could not purchase good Cotton from the Ryots at market price. 2ndly. The expenses of ginning were so heavy, as to render its use utterly impracticable as a mercantile transaction. 179

Mr. Finnie's letter, 12th Aug. 1847. Parl. Return (1857) p. 363.

1st. High prices demanded by the Ryots for their seed Cotton.—The arrangement made by Mr. Finnie to purchase seed Cotton from the Ryots proved a failure; and he was unable to procure a sufficient quantity to keep his few gins in working order. The seed Cotton delivered to him was always so inferior to the sample that he was compelled to reject it; and though he was ever willing to take it at a reduced price in proportion to the quality, yet in that case the people preferred selling it to the Brokers. The object of the Ryots appeared to be to compel him to purchase the Cotton at their own price; but against this proceeding Mr. Finnie made a determined stand. Government could afford to lose, but if once the precedent of high prices were established, it could never be broken through. He considered that the object of the experiment was to ascertain if the business could be carried on as a mercantile transaction; and if high prices were created, no merchant would ever succeed in carrying on the business. 180

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Mr. Finnie's letter, 23rd Sept. 1847. Parl Return (1857) p. 280. Letter, and Statement to Messrs Arbuthnot & Co. 26th Aug. 1847. Ibid p.365, 366.

181 **2nd. Heavy expenses of ginning.**—Mr. Finnie submitted at the same time a tabular statement, exhibiting the cost of ginning operations. This estimate was confined to the actual expenses of the day, excluding the rent of the house, and the cost of machinery and superintendence. Moreover, he reported that the business was conducted, and the expenses disbursed, under his own eye; and consequently with greater celerity and stricter economy than could be expected when left to the Native servants. From his statement, which is exhibited on the opposite page, it would seem that the net cost of every pound of gin cleaned Cotton was nearly 3½d. Accordingly, Mr. Finnie inferred that it was utterly impossible to use the gin in cleaning Cotton as a mercantile transaction. He also reported the same results to Messrs. Arbuthnot and Co., of Madras; and the latter concurred in his conclusions, but trusted that a machine might yet be constructed, which would clean the Cotton in a manner equally efficient, and at a less cost. The Statement of Mr. Finnie bears the following title:—

Messrs. Arbuthnot & Co's. letter, 17th Sept. 1847. Parl. Return (1857) p. 365.

"Tabular Statement, showing the quantity of seed Cotton cleaned in a day by one Thresher and three Gins, two of twenty-five saws, and one of twenty saws; the per centage and quantity of clean Cotton from a given quantity of seed Cotton, and the amount and per centage of waste; the cost of seed Cotton, cost of separating the seed from the fibre and total cost per candy of clean Cotton in Rupees (reduced to English money,) and cost per lb. in English money."

Mr. FINNIE'S TABULAR STATEMENT.

		No. of Saws.	Time required to clean 100 lbs. of Seed Cotton. h m.
Gins....	No. 1	25	1 5
	No. 2	25	2 7
	No. 3	20	about 1 0

	lbs.
Total of Seed Cotton in lbs., Avoirdupois	1,700
Total of Clean Cotton in lbs. obtained from the Seed.	370¾
Average of lbs. of Clean Cotton obtained from 100 lbs. of Seed	21·81
Cotton Seed in lbs. after separated from the staple	1,280½
Average of Seed obtained from 100 lbs. of Seed Cotton after ginning	75·33
Loss and Trash from Thresher in lbs	29½
Do. per 100 lbs. of Seed Cotton	1·73
Loss and Trash under the Gin in lbs	18
Do. on every 100 lbs. of Seed Cotton	1·06
Loss and Trash and small particles of Cotton in Flue in lbs	1
Do. on every 100 lbs. of Seed Cotton	0·06
Imperceptible loss in lbs	¼
Do. on every 100 lbs. of Seed Cotton	0·11

	R. A. P.	£ s. d.
Cost for Seed Cotton of six Podhees at Rs. 7-10 (15*s.* 3*d.*) per Podhee	45-12-0 =	4-11- 6
Cost of labour for ginning, or separating the Seed from the Cotton	7- 9- 6 =	0-15- 2¼
Cost of cloth, sowing, packing, twine, and oil for gins	2- 7- 6 =	0 -4-11¼
Total cost of 1,700 lbs. of Seed Cotton	55-13- 0 =	5-11- 7½
Deduct amount realized for Seed, Rs. 1-6 (2*s.* 9*d.*)	7-15- 0 =	0-15-10½
Net cost of 370¾ lbs. of Clean Cotton, exclusive of Establishment and Superintendence	47-14- 0 =	4-15- 9
Rate per candy of 500 lbs. of Cotton after deducting amount realized for Seed	64- 9- 0 =	6- 9- 1½
Net cost per lb. of Clean Cotton		0- 0- 3⅜
		$\left(\frac{49\frac{1}{2}}{500d.}\right)$

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182 **Necessity for improving the construction of the Gin.**—Upon the relative working of each of the gins, Mr. Finnie reported as follows. It will be remembered that he had two 25 saw gins, and one of 20 saws. Each of the two 25 saw gins required thirteen men a day to work it; namely, two sets of six men to turn the wheel, and relieve each other alternately; and one man to attend to the gin, such as feeding it with seed Cotton, and removing the staple freed after separation. One gin however would clean 100 lbs. of seed Cotton in one hour; whilst the other would not clean the same quantity under two hours. Then again the 20 saw gin did almost as much work as the best 25 saw gin, though it only required nine men to work it; namely, one man for the gin, and eight men at the wheel; the latter relieving each other alternately in sets of four. This last gin had been made by Mr. Petrie, and was pronounced by Mr. Finnie to be the best he had seen in India. These facts served to show that much depended on the construction of the machine, and that further improvements might yet bring the gin into constant and profitable use in India.

Mr. Finnie's letter, 23rd Sept. 1847. Parl. Return (1857) p. 279.

183 **Third season, 1847-48: stage of the Cotton experiment in Tinnevelly.**—The general operations of Mr. Finnie during his first two seasons at Tinnevelly do not appear to have been attended with any particular result; beyond ascertaining the facts that American Cotton would yield a good crop in localities enjoying the benefit of both monsoons, and that the American gin as then constructed could not be profitably employed in commercial transactions. Accordingly, he now desired to extend the cultivation of American Cotton, and to take steps for ensuring the co-operation of the manufacturers and merchants at home.

184 **Planting operations: successful culture of American Cotton in the Courtallum valley.**—It has already been seen that the American Cotton grown during the second

season had only proved really successful in the Courtallum valley, which enjoyed the benefit of both monsoons. Accordingly, early in the third season, Mr. Finnie obtained the Government sanction to establish a model plantation of about a hundred acres in the same quarter. The cultivation was to be carried out upon lands held by Government, and under his own superintendence, either by hired labour or by contract at so much per acre; but the cleaning, planting, and preparation of the soil, were to be accomplished by Native implements, as an example to the landholders, and as an inducement for them to adopt the culture on their own account. At the same time, Mr. Finnie proposed to distribute seed to all who were willing to cultivate the American Cotton, and to take the produce off their hands at a fixed rate per candy on Government account; and he hoped that in time he should be able to retire from the culture, aud leave it entirely in the hands of the people, merely taking the produce at its value. He was perfectly satisfied that the American Cotton would grow well, wherever the land enjoyed the benefit of both monsoons; and he had not the slightest doubt but that the people in the neighbourhood of those favoured spots would find the cultivation a profitable source of employment. The Government sanction was given on the 30th of June, and Mr. Finnie immediately proceeded to Courtallum to commence operations; but on his arrival the heavy burst of the South-west monsoon was over, and he had to wait until the 10th of September before he could commence clearing and planting. Notwithstanding, however, that the Cotton was planted too late, we are told that it did very well and produced a good crop.

Mr. Finnies letters, 24th April and 2nd June 1847. Parl. Return (1857) p. 273, 274.

Minutes of Consultation, 30th June 1847. Parl. Return (1857) p. 275.

Mr. Finnie's letter, 18th March 1848. Parl. Return (1857) p. 364.

Unsuccessful culture at Sevacausey, Virdooputty, and Aroopoocottah.—During this same season, Mr. Finnie ordered a few acres to be planted with American Cotton at the three stations of Sevacausey, Virdooputty, and Aroo- 185

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poocottah; merely, however, out of deference to the advice of Dr. Wight, and merely to prevent his opponents from saying that the experiment had not been fairly tried. At the commencement of the season he expected a complete failure, but the results do not appear to have been quite so unsatisfactory as he had anticipated. At the close of the season he reported, that whilst the plants had failed in the open plains, those in protected spots had grown very well and yielded some Cotton.

Mr. Finnie's letter, 23rd Sept. 1847. Parl. Return (1857) p. 279. Mr. Finnie's letter, 13th April 1848. Parl. Return (1857) p. 278.

186 **Agency operations: Mr. Finnie requests permission to proceed to England to consult with the Cotton Manufacturers.**—About Christmas time, that is after the Cotton had been planted but before it had begun to ripen, Mr. Finnie began to grow exceedingly disgusted with his forced inactivity in Tinnevelly. "Where is the necessity," he wrote, "of keeping me here to look at the working of three miserable gins? The gin house, which is ordered at Sevacausey, will not be completed for six or eight months longer; and by that time the coming Cotton season will be over. Thus with the means at my disposal I can do but very little this year; and at the same time I never shall be able to effect much for the improvement of the Indian Cotton, without I have the co-operation of the manufacturers and merchants at home. I am therefore constrained to propose to the most noble the Governor in Council, the Marquis of Tweeddale, to depute me to England, to consult with the manufacturers, and to ascertain how far they are disposed to patronize the measures which they urge on the Honorable Court of Directors." The Marquis of Tweeddale approved of this proposition, and recommended it to the favourable notice of the Court of Directors. The Court however did not see that any advantage was likely to accrue from such a proceeding, and therefore declined to comply with it.

Mr. Finnie's letter, 23rd Dec. 1847. Parl. Return (1857) p. 275.

Revenue letter, 17th Jan. 1848. Parl. Return (1857) p. 275. Dispatch from Court of Directors, 4th July 1848. Ibid p. 276.

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187 **Operations with the Churka, Thresher, and Gin: meeting of the Cotton Brokers of Tinnevelly.**—Whilst Mr. Finnie's proposition to visit England was under the consideration of the Court of Directors, he was still engaged, according to his own account, in endeavouring to secure the co-operation of the people in promoting the improvement of their Cotton. On the 28th March 1848, he had a meeting with the principal Cotton Brokers of Aroopoocottah, and explained his views respecting the importance of attending to the cleanliness of Indian Cotton; as well as his plan for a European Agency, by means of which he could give a better price for the pure article than for the mixed dirty one. In reply, the Brokers admitted that the gin was an excellent machine, but said that it was too expensive for them. As regarded the thresher, they said that they were quite prepared to use it for taking the dirt and trash out of the Cotton; first, because it was both good and cheap; and secondly, because it loosened the Cotton on the seed, and thus enabled the churkas to do more work.

Mr. Finnie's letter, 28th March 1848. Parl. Return (1857) p. 285.

188 **Cost of cleaning with the Thresher and Churka as compared with that of the Gin.**—Mr. Finnie then gave to the Brokers for a few days the use of his gin house and thresher. They brought their own Cotton, as well as their own churkas and people. The Cotton was first put in the thresher, and then churkaed, for the purpose of ascertaining the cost of this mode of cleaning. Mr. Finnie reported that the result was highly favourable. The relative cost of cleaning a candy of 500 lbs. of Cotton, he estimated as follows:—

Mr. Finnie's letter, 17th May 1847. Parl. Return (1857) p. 288.

	Rs.	A.	P.		£	s.	d.
With the Churka.......	4	14	8	=	0	9	10
With the Gin......	10	3	10	=	1	0	5¾

In a foot note however, Mr. Finnie so far modified his opinion as to bring the expense of both methods more to a level. On the one hand, he found it necessary to beat the

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churka cleaned Cotton ; and this process cost Rupees 1-5-9, or 2*s.* $8\frac{5}{8}$*d.*, per candy of clean Cotton. But then, on the other hand, he thought that the gins might be worked at one-third the amount stated, if they were properly constructed, and if the coolies would work at the ordinary hire for daily labour, instead of insisting upon three annas, or four pence half penny, per diem.

189 **Cost at which clean unadulterated Cotton might be supplied.**—Mr. Finnie estimated the actual cost of the pure unadulterated Cotton, first quality, at 52 Rupees or £5 4*s.* per candy. To this was to be added the beating, which cost 2*s.* $8\frac{1}{4}$*d.* per candy ; and the carriage to the shipping port, which cost 2*s.* $10\frac{1}{2}$*d.* per candy. Total, £5 9*s.* $6\frac{3}{4}$*d.* To this was also to be added the Brokers's profit, which was never fixed but depended on the fluctuations of the market. Altogether, he calculated on the whole, that he should be able to insure a supply of the first quality of Cotton, at from £5 10*s.* to £6 per candy of 500 lbs. delivered at the shipping port.

190 **Recommends the introduction of small hand Threshers and cheap Presses.**—Mr. Finnie still reiterated that the dirty condition of Indian Cotton was not the effect of carelessness, nor of the inefficiency of the Native appliances for cleaning ; but that it was the result of a deliberate design and systematic procedure. The Ryots brought their best article as clean, and as free from dirt and trash, as the majority of American planters. But this best quality was never seen by the European ; but was all consumed by the Native merchants in their domestic traffic. The Cotton taken by the independent Native states, was far superior to any that the European merchants could get at the price at which they expected to obtain it ; whilst the refuse of that which was used for domestic ma-

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nufactures, was all reserved to be mixed with the article which the European merchant took for export. All that was necessary was, to assist the people with the simple means which they themselves desired. Accordingly, Mr. Finnie proposed to give them small hand threshers, both to separate the dirt and trash from the seed Cotton, and to loosen the staple on the seed so as to aid the churka. Also, to remedy their defective mode of packing, by erecting small plain cheap presses in the villages; so that the people, instead of packing their Cotton in large loose bundles with their feet, might press their Cotton properly in neat small bales, say of 100 lbs. or 120 lbs., of which two would form a bullock-load.

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Mr. Thomas's letter, 2nd June 1848. Parl. Return (1857) p. 284. Minutes of Consultation, 27th July. 1848. Ibid p. 298.

Small hand Threshers and Presses sanctioned.—The proposal that Government should set up a few small hand threshers, and some cheap simple presses, in different localities, was strongly supported by Mr. E. B. Thomas, the Collector of Tinnevelly. Accordingly it ultimately received the sanction of the Madras Government; the number of the different machines, as well as their local positions, being left to the discretion of Mr. Thomas in communication with Mr. Finnie.

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Mr. Thomas's letter, 2nd June 1848. Parl. Return (1857). p. 284.

Mr. Thomas believed that Cotton was not adulterated by design, and that good Cotton was often sent home.—Mr. Thomas did not concur in Mr. Finnie's opinion, that the inferior quality of the Cotton, and its dirty and adulterated state, were the result of deliberate design and system. Neither did he believe that all the best Cotton was used in the country, nor that the worst only was exported, nor that the European Agents on the coast bought only the trash and refuse. On the contrary, he believed that all the Agents were careful and rigorous in excluding bad and dirty Cotton from their contracts, and that they made every effort to secure a good article; and for several years past he had

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been at various times into all their warehouses, and had seen very much good clean Cotton, which he had heard had fetched good prices at home.

193 **No market or Agency required in Tinnevelly.**—At the same time Mr. Thomas stated that a good market for Native Cotton already existed in Tinnevelly, and that there was no occasion for creating a new market, as Mr. Finnie seemed to argue. Cotton in Tinnevelly found a ready sale, and the price varied but little from year to year. Again, Mr. Thomas could not understand what was meant by the "co-operation and organised system," which Mr. Finnie requested from the home manufacturers and the Madras Government. If an Agent for the purchase of all Cotton was intended, such an arrangement should be left to the merchants and manufacturers themselves; but such an Agency, with the advantage of competition superadded, already existed at Tuticorin, where six Agents were already established for the purchase of the best Cotton that could be obtained.

194 **Cultivation of New Orleans Cotton, and improved cleaning, the main points.**—Mr. Thomas believed that the results to be really attained were:—first, the cultivation of the New Orleans and better kinds of Cotton; and secondly, the exercise of greater care and cleanliness in picking and packing. These results could only be obtained by patient perseverance and practical experiment amongst the people. So far as cleaning the Cotton was concerned, Mr. Finnie was profitably employed; but Mr. Thomas considered that larger sowings of better sorts of Cotton, and greater attention to the cultivation of Cotton by Mr. Finnie and others, would prove of much practical benefit.

195 **Mr. Finnie's design for a cheap Cotton Press.**—Mr. Finnie subsequently wrote a very long letter in further explanation of his views, but it adds little or nothing to

what has been said before. He reiterated that the Agents at Tuticorin did not take the proper measures with the Natives themselves for securing the best Cotton; but added that this was not so much the fault of the Chitties, who were screwed down to the lowest possible price, as it was the fault of the English merchants and manufacturers at home, who had not taken the necessary steps for creating a sure market for the superior article. He also forwarded a sketch of a lever press which he had invented for pressing the Cotton into a small compass for packing; the elasticity of the fine clean Cotton being so great, that the packing cloth was frequently torn, and a considerable loss sustained by the exposure of the Cotton, and the collection of trash. This press may be thus described. It consisted of two uprights securely set in masonry, with a cross beam at the top. Between the uprights was a box, with fixed sides, but moveable ends at the top and bottom. Suspended from the cross beam was a moveable beam, which could be forced down upon the box by means of levers, acted on either by men or heavy weights. The Cotton was placed in the box and pressed into a bale by the cross beam, which was forced down by the levers. Mr. Finnie requested that this press might be constructed immediately at the Government Arsenal; but it never appears to have been completed, as Mr. Finnie subsequently represented that he was engaged in preparing another simple press for Native use.

Mr. Finnie's letter, 25th Oct. 1848. Parl. Return (1857) p. 368.

Mr. Finnie's letter, 31st May 1848. Parl. Return (1857) p. 366.

Mr. Finnie's sample of Churkaed Tinnevelly Cotton equal to American.—Towards the close of the third season, Mr. Finnie made an announcement to the Madras Government, which serves to place the character of his whole proceedings in the strongest possible light. It has already been seen that Mr. Finnie had opposed himself equally to the cultivation of the American Cotton and the use of the American gin; and that he professed to devote 196

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his chief attention to the improvement of the Native Cotton, and of the Native methods of cleaning. Accordingly, whilst the subject of his proposed visit to England was still under the consideration of the Court of Directors, he suddenly announced that he had brought the whole question to a successful issue. In May 1848, he forwarded to the Madras Government a sample of Tinnevelly Cotton, which had been separated from the seed by the churka alone, but of which the particles of trash had been subsequently picked out of the wool by hand. This sample he declared to be a very superior article; it had been taken from a roomful, and was a fair sample of what the churka could turn out, under the new regime which he had induced the Cotton cleaners to adopt. If a quantity could only be shipped to England viâ America, he was satisfied it would be regarded as a good fair quality of American Cotton. The Natives themselves were scarcely aware that they could make the Cotton so clean, until he had thus induced them to try; and he believed that a few thousand bales of such an article, arriving in England from India, would be the most important event which the commercial world had known for many years. Already he had nearly the whole of a village at work in producing such very superior Cotton; and provided that he were sufficiently encouraged, and that purchasers could be found willing to give a reasonable price, he pledged himself to have the whole crop of the district of Tinnevelly ultimately cleaned in this satisfactory manner. A safer investment, he said, could not be made; and he accordingly suggested that the Government should allow him to encourage the production of such an article to the fullest extent.*

Mr. Finnie's letter, 24th May 1848. Parl. Return (1857) p. 283.

*The following extracts from the letter condensed in the text will furnish some idea of Mr. Finnie's style and language. "I have the honour, the pleasure, and the satisfaction to forward for the inspection of the Right Honorable the Governor, a specimen of Cotton which was cleaned by the churka alone, of course, the particles of trash being separated by the hand;

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Madras Government refer the sample to Dr. Wight, the Chamber of Commerce, and the Court of Directors.—Before sanctioning large purchases of such Cotton as Mr. Finnie recommended, the Madras Government referred the sample for the opinion of Dr. Wight and the Madras Chamber of Commerce; and at the same time required from Mr. Finnie a clear business like statement, showing how much Cotton of the same quality as the sample forwarded, Mr. Finnie could command within the ensuing six or twelve months; as well as the price paid to the grower per candy, the cost of packing per candy, the cost of transit to the port, and the freight charges. In a word, the Government desired to learn the data on which Mr. Finnie based his statement, that a safer remittance could not be made. 197

Minutes of Consultation, 10th June 1848. Parl. Return (1857) p. 283.

Dr. Wight's report: Mr. Finnie's sample is "good Tinnevelly," which no one could mistake for American.—Dr. Wight reported on Mr. Finnie's sample as follows. It is such Cotton as would be called in Liverpool "good Tinnevelly." In average states of the markets, it would 198

Dr. Wight's letter, 21st June 1848. Parl. Return (1857) p. 293.

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and I now have nearly a whole village at work producing such Cotton as this; and if I am encouraged to go on, I will pledge myself ultimately to have the whole crop of Tinnevelly thus cleaned, provided always that purchasers can be found willing to give a reasonable price for the article.

"Hitherto I have not proclaimed success, because I did not consider that it had been attained; but I believe, now, that we have commenced a very pacific "revolution" in Cotton among the democratic republicans of Hindostan!! A free and more independent race does not exist. They are not fond of a total change, especially when unprofitable; but a little persuasive eloquence to convince them that we are in earnest, especially when accompanied by the consonant clink of the coin they like, will speedily bring them to compliance with reasonable demands on their efforts.

"A complete reformation has taken place in some of the Native Cotton cleaning houses here; hitherto they have been filled with rubbish and a "compound of villanous smells," and now they are clean, nicely matted. This was effected by reason, applied through the shafts of ridicule, of which the people are peculiarly sensitive.

"Amidst mountains of opposition, I have persevered in my efforts to awaken an interest in the people on the subject of the importance to them, individually and nationally, of preparing their great source of wealth in a manner that would render it valuable abroad. The people themselves scarcely knew that they could make the Cotton so clean until they were made to try. They have never had a demand for a clean article, and it is not strange they did not prepare it. Why should they?"

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realize from $3\frac{3}{4}d.$ to $4\frac{1}{2}d.$ per lb.; in more favourable states it might fetch $5d.$ or $5\frac{1}{4}d.$ It is about the same quality as 300 bales of gin cleaned Cotton, which were sent home from Coimbatore in the beginning of 1847, when prices ranged unusually high; and which on that occasion fetched $5\frac{3}{4}$d. Six bales of American Cotton purchased from Ryots, were sold at the same time for $6\frac{3}{4}$d. Whilst however Mr. Finnie's sample is the same quality as the 300 bales of gin cleaned, it must be borne in mind that gin cleaned Cotton has always sold higher than churka cleaned; first, because it looks better and is easier carded; and secondly, because it is more free from sand and other impurities, which add to the weight but detract from the value. Mr. Finnie's sample however is not a faithful one. The particles of trash have been separated by the hand, and consequently the sample is more valuable than the mass from which it was taken, and which could not be picked in the same manner excepting at a ruinous charge. As regards Mr. Finnie's statement, that if the Cotton could be sent to England viâ America, it would be mistaken for American Cotton; such a thing is impossible, as the English Brokers would have detected it at once from the shortness of the staple. Indeed the Native merchants at Coimbatore had valued the Tinnevelly at 39 and 40 rupees, or 78*s.* and 80*s.*, per candy; whereas they would not value the American Cotton at all, as it had not obtained sufficient currency in the Indian markets for them to fix a valuation. Again, the fact that six bales of Indian grown American Cotton sold at Liverpool at 1d. per lb. higher than a batch of first rate Indian Cotton, sufficiently established the superiority of the American.

199 **Large shipment of Churkaed Cotton contrary to the orders of the Directors.**—With regard to Mr. Finnie's request that he might be permitted to make large shipments of the churka—cleaned Tinnevelly Cotton, in order to

encourage the production of the article, Dr. Wight explained that the dispatch from the Court of Directors ordering the 6000 bales, limited the investment to gin—cleaned Cotton. Subsequently however, during the discussion as to whether or no the saw gin cut and injured the staple, he, Dr. Wight, had obtained permission to purchase about 500 bales of churkaed Cotton to be sent along with the ginned, in order to enable the spinner to ascertain the relative advantages of the two modes of separating and cleaning. The Directors had approved of this suggestion, but had modified it by ordering that sufficient seed Cotton for a thousand bales should be purchased; and that 500 bales should then be cleaned by the gin and 500 by the churka, and the whole be sent home at the same time. If Mr. Finnie could therefore purchase the seed Cotton for this experiment, and would clean one half with the gin and the other half with the churka, his aid would be of considerable service.

Dr. Wight's system of purchase compared with 200
that of Mr. Finnie.—Dr. Wight took this opportunity of explaining his own system of purchase, as compared with the organised system darkly alluded to by Mr. Finnie. He had ascertained that carefully picked Cotton is never dirtied or mixed with trash in passing through the churka or gin. Accordingly he had systematically rejected every load of ill picked Cotton, and thus was saved from the necessity, common amongst Native merchants, of mixing the good with inferior qualities. By so doing he was compelled to give from half a rupee to a rupee per candy more than the Native merchants; but then he secured the pick of the market; and in all probability his Cotton would fetch higher prices in England than the generality of Native Cotton.

Madras Chamber of Commerce confirm Dr. Wight's 201
valuation of Mr. Finnie's Cotton.—The opinion expressed by Dr. Wight on Mr. Finnie's sample of Tinnevelly

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Mr. Ouchterlony's letter, 28th June 1848. Parl. Return (1857) p. 296.

Cotton seems to have been fully endorsed by the Madras Chamber of Commerce. The Chamber found the sample to be very clean and of good colour, but of short staple. Taking the then extreme range of London prices for Tinnevelly Cotton at 3d. to 4d. per lb., and assuming that a parcel of uniform good quality would realize 3½d. per lb., the Chamber considered that a parcel equal to Mr. Finnie's sample, would realize that price, viz. 3½d. per lb. and possibly might fetch ⅛d. per lb. more.

Despatch from the Court of Directors, 18th July 1849. Parl. Return (1857) p. 195.

202 **Manchester Commercial Association pass a similar judgment upon the Cotton.**—Mr. Finnie's famous sample of Tinnevelly Cotton equal to American, was of course sent home to the Court of Directors, and by them transmitted to Mr. Aspinall Turner, the President of the Commercial Association of Manchester. The result fully confirmed what had been already stated by Dr. Wight and the Madras Chamber. In a letter from Mr. Turner to Dr. Royle the following judgment was passed :—

" I may say, generally that the Cotton sent by Mr. Finnie, " grown from Native seed, is very much the same as we " have been in the habit of receiving for years past from " Madras. You are aware that it has not entered largely " into consumption in this country ; and I can only repeat " emphatically, what I have often asserted before, that it is " a perfect delusion in Mr. Finnie or any one else supposing, " that such Cotton will ever pass off to the spinners of Lan" cashire as a substitute for American Cotton. It has " nothing to recommend it, except being of a bright clear " colour ; the staple is miserably short. The Brokers' report " (Corrie and Co.,) states that it has been destroyed in " cleaning; but I doubt if it ever had much staple. The " samples of American seed Cotton are very different, and " are valued by the Brokers at 18 per cent. more than the

"others." Such was the brilliant achievement that closed the third season of Mr. Finnie's career. CHAP. IV.

203 **Fourth season, 1848-49: proposed extension of planting operations.**—The fourth season of Mr. Finnie's operations at Tinnevelly opened with a bold representation, and two equally bold propositions. He represented that his labours in effecting an improvement in Native Cotton were of such vast importance, that he could no longer attend to the cultivation of American Cotton in the Courtallum valley, which he said was nothing more than cultivating an exotic in an oasis. Accordingly he begged that the plantation of one hundred acres at Courtallum, which he had cultivated the preceding year, might be planted for the ensuing season by the Native assistant. At the same time however, he expressed his willingness to do what he could in extending the cultivation of American Cotton. Notwithstanding the strong objections which he had expressed to the establishment of large Farms; notwithstanding his convictions that New Orleans Cotton would only grow in localities enjoying the influence of both monsoons; he was prepared to set aside his own views, and to establish one Cotton plantation at Aroopoocottah, and another at Sevacausey, on as large a scale as Government thought proper to sanction. For himself, however, he strongly preferred his own system of operating directly through the people. He would employ a number of Ryots, on monthly salaries of from ten to sixteen shillings per mensem, to grow American Cotton on their own lands; the produce to be their property, and when nicely cleaned, to be taken off their hands at four shillings per candy above the current market price of the Native article. The merits of the two systems may be easily compared. A Cotton plantation under any circumstances, would cost fifteen or twenty pounds a month. If conducted by Europeans, the produce however successful,

Mr. Finnie's letter, 31st May 1848. Parl. Return (1857) p. 292.

Para 181.

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would be less than the cost; whilst the enormous expense would frighten the people from the culture. On the other hand, by distributing the same amount among the Natives they would be induced to carry out the experiment themselves, and would certainly attain success, if success were really possible. These propositions however appear to have met with no response from the Madras Government. At the time they were written, the Marquis of Tweeddale had departed for Europe, and Sir Henry Pottinger had succeeded him as Governor of the Presidency.

204 **Mr. Finnie's matured judgment against the culture of American Cotton or use of the American gin.**—Shortly afterwards, Mr. Finnie had occasion to record his matured opinion in favour of the indigenous Cotton and Native churka, as opposed to the American Cotton and American gin. He could not, he said, after devoting his best attention to the subject, entertain much hope of the success of the American Cotton. It failed in Southern India on account of the cold nights which prevail after a scanty monsoon. If there were occasional showers of rain after the 1st of February when the weather became warm, and if the ravages of insects could be also avoided, then the American Cotton would succeed admirably; but in the absence of rain at that season, he was afraid that it would never become the staple of India. Again, as regarded the American gin, he could give no hope of its ultimate adoption by the Natives; and as for the European merchants, they never would be able to carry on operations in seed Cotton, but must leave such work in the hands of the Native Brokers.

Mr. Finnie's letter, 20th Jan. 1849. Parl. Return (1857) p. 191.

205 **Pronounces in favour of the Indigenous Cotton and Native Churka.**—But whilst holding the foregoing opinions, Mr. Finnie looked hopefully forward to such improvements in the Indigenous Cotton and the Native chur-

ka, as would accomplish for India what never would be insured by either the exotic plant or the foreign machinery; namely, the extension and improvement of the Cotton of her soil, and the consequent prosperity of her "poor Ryots." He did not indeed believe that any degree of culture would materially improve the staple in an Indian climate; but he considered that the Indigenous Cotton was capable of extension, that better culture would ensure more ample returns, and that due attention to qualities would secure a large quantity of a most useful and valuable article. Already he believed that more attention was paid to the quality than formerly; for the Agents at Tuticorin had informed him, that more good Cotton had been received there from the crop of 1847-48, than had ever been known before; a result which he attributed in some measure to his own humble efforts to convince the people of the importance of cleaning their Cotton. The perseverance of the Natives in this course would of course depend upon the encouragement they received, and the inducements offered them to keep the different qualities separate, and the best clean Cotton unadulterated with inferior sorts. If the Natives could make more money by selling the quantities separate, than they could by selling them mixed,—then of course they would keep them separate, and much unadulterated Cotton would be exported from India.

Native Cotton should be first threshed, next churkaed, and finally cleaned by hand.—As regarded the separation of the staple from the seed, Mr. Finnie was satisfied that the time honoured churka was a much more efficient instrument than was generally supposed; and he did not believe that a better substitute would easily be found. Two other processes were however necessary, one before and the other after the churkaing. Before the Cotton passed through the churka, the dirt, trash, and rotten locks, should 206

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be separated from the seed Cotton ; and this, as Mr. Finnie had previously indicated, could be best carried out by the thresher. Then again, after the Cotton had passed through the churka, a subsequent process was necessary to separate the remaining small particles. This process consisted in beating the Cotton on cots, so as to allow the impurities to fall below it ; and this gave a lively and fine appearance to the Cotton, and rendered it really clean and beautiful, as clean indeed as the Cotton generally produced in America. This work was performed by hand, and was certainly tedious; but in a country where there were so many people whose time was of little value, the work could be performed much cheaper by hand than by machinery.

207 **Erection of Mr. Finnie's Gin house and Driving Machinery at Sevacausey.**—Up to the early part of 1849, Mr. Finnie's ginning operations appear to have been on a very limited scale. Dr. Wight continually urged the importance of completing the order of the Court of Directors for 6000 bales of East India Cotton, but still little or nothing was done by Mr. Finnie. He had, as we have seen, three gins occasionally at work in a small house which he had hired at Aroopoocottah; but during the second season he only ginned nine candies of Cotton, and during the third season only thirty-six candies ; thus making forty-five candies in all,—each candy being equivalent to about a bale. But early in 1849, the new Gin house, which had been commenced at Sevacausey for the reception of the Driving Machinery purchased at Jaffna, was fast approaching completion. The delay had arisen from the difficulty of procuring timber, which had become scarce and dear in Tinnevelly, and which moreover had to be carried a considerable distance from the hills. In February 1849, Mr. Finnie began to take the necessary steps for procuring two large sixty saw gins from Dr. Wight, and the Driving Machinery from Tuticorin, where it had been lodged ever

Mr. Finnie's letter, 7th Nov. 1848. Parl. Return (1857) p. 198.

Mr. Elton's letter, 24th April 1849. Parl. Return (1857) p. 300.

since it had been purchased. The idea was to keep the three hand gins working in the hired house at Aroopoocottah; and to set up five new gins in the new gin house at Sevacausey; viz., two 60 saw gins to be moved by cattle, and three 20 or 25 saw gins to be worked by hand, in order to settle the question of hand labour *versus* cattle labour. Accordingly Mr. Finnie applied for three more small gins to be worked by manual labour at one end of the new gin house at Sevacausey; and for two 60 saw gins to be worked by cattle attached to the Driving Machinery at the other end. The result was that the two 60 saw gins were obtained and set up; that the Driving Machinery was also set up; and that twenty bullocks and drivers were obtained from the Commissariat department. The three hand gins however never appear to have been forwarded to Sevacausey.

Mr. Finnie's letter, 2nd Feb. 1849. Parl. Return (1857) p. 372.

Relative cost of the Churka, the Hand-gin, and the Cattle-gin.—But though Mr. Finnie had not been able to set up both the hand-gins and the driving machinery in the same house, he was still enabled, a few months afterwards, to furnish the following table of the relative cost of the churka, the hand-gin, and the cattle machinery. 208

Mr. Finnie's letter, 11th Sept. 1849. Parl. Return (1857) p. 373.

Cost of separating the staple from a Candy of clean Seed Cotton.

	R. A. P.		£. s. d.
By the Churka..............	4-14- 8	=	0- 9-10
By the Hand-gin (contract)..	6-14- 4	=	0-13-9½
By the same (hired labour)...	10- 3-10	=	1- 0-5¾
By Cattle machinery..........	8-13- 6	=	0-17-8¼

Mr. Finnie pointed out that, according to this table, the hand-gin, even when worked by contract, was more expensive than the churka; without taking into consideration the original outlay, or the cost of wear and tear. Then again the

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Cattle machinery was much more expensive than the hand-gin ; and if the calculation were made for the whole year, the Cattle machinery would be found infinitely more expensive, as the bullocks and drivers would have to be kept up constantly, even when no ginning was going on. If however the people would employ the bullocks in ploughing the land, as well as in ginning the Cotton, they might reduce the expense ; but even then, the capital required for setting up such an establishment would exhaust the whole fortune of several Cotton dealers.

Mr. Finnie's letter, 18th April. 1849. Parl. Return (1857) p. 300.

209 **Mr. Finnie refused permission to extend his operations to Coimbatore.**—Whilst the Cattle machinery was thus being put in working order at Sevacausey, Mr. Finnie requested permission to extend his operations to Coimbatore. He stated that the people of Tinnevelly and Madura were now sufficiently aware of the importance of attending to the cleanliness of their Cotton ; and that the Agents were at last stipulating for a well cleaned article, which was the great object to be obtained as regarded the Indigenous Cotton. The people therefore in the neighbourhood of Sevacausey and Aroopoocottah no longer required such constant personal attention from himself; and he consequently desired to extend his system over the length and breadth of the land. As a first step in this important work, he proposed to extend his supervision to Coimbatore; where he promised not to come in conflict with Dr. Wight, but to devote himself to persuading the people to extend their cultivation of Cotton, and to clean it by the means already at their command, in a manner more suitable to the wants of the purchasers. Mr. Finnie however was informed that the Governor in Council was not disposed to accede to his application ; and that pending certain measures which were in contemplation, and which would be communicated in due course, it was thought

Minutes of Consultation, 16th May 1849. Parl. Return (1857) p. 301.

best that he should confine his operations to the districts of Madura and Tinnevelly. In other words the Madras Government had already determined on bringing the Cotton experiment to a close, and dispensing altogether with the services of both Mr. Finnie and Dr. Wight. Indeed in the following October, Mr. Finnie appears to have been on his way to England; but before noticing the circumstances which immediately preceded this event, it will be necessary to glance at a few particulars which are best narrated in a separate chapter.

CHAPTER V.

DISPUTES BETWEEN Dr. WIGHT AND Mr. FINNIE, DISCUSSIONS OF THE MADRAS GOVERNMENT AND COURT OF DIRECTORS, AND FINAL CLOSE OF THE EXPERIMENTAL CULTURE.

1849 to 1853.

(210.) Marquis of Tweeddale succeeded by Sir Henry Pottinger: breach between Dr. Wight and Mr. Finnie. (211.) Mr. Finnie convinced of the folly of cultivating American Cotton in India: Dr. Wight recommends his removal. (212.) Points of the dispute: summary of the Correspondence.

Discussion between Dr. Wight and Mr. Finnie.

(213.) Mr. Finnie to Dr. Wight, 7th November 1848: "I have had great difficulties in ginning, but have induced many Natives to plant American Cotton." (214.) Dr. Wight to Mr. Finnie, 15th November: "Your purchase of churkaed Cotton is illegal, your culture of American Cotton unsatisfactory, and your ginning too expensive." (215.) Mr. Finnie to Dr. Wight, 18th December: "My plans have all been approved by the authorities." (216.) Dr. Wight's explanations, 30th January.

(217.) General opinions of the Madras Government and Court of Directors upon the experimental culture.

Views of the Marquis of Tweeddale.

(218.) Propositions of the Marquis of Tweeddale in 1847: First, To relinquish the experimental Farm in Coimbatore. (219.) Second, To establish small Model Fields under a practical Agency, amongst the Native Cultivators. (220.) Third, To set up small Gin Establishments, and to keep up good roads to the Ports. (221.) Limits to Government Agency: the Manufacturer should purchase direct from the Ryot.

Views of the Court of Directors.

(222.) Dispatch of the Court of Directors, 1848. (223.) First, The Cotton Farm at Coimbatore may be relinquished: it has proved that the right Cotton can be grown, and the price alone remains to be ascertained. (224.) "Agency confined to practical Planters" may be tried on a small scale.

(225.) Minute of Sir Henry Pottinger, May 1849. (226.) The Experimental Farms have been fully tried, and their continuance would be injurious. (227.) American Cotton in any part of the Madras Presidency liable to failure. (228.) Causes of the failure of American Cotton: climate and soil. (229.) Dr. Wight ascribes the failure in Coimbatore to the want of humidity, but humidity does not mean rain. (230.) The Ryots should now be left to themselves, with such aid as the Revenue Establishments may give. (231.) Mr. Finnie to remain in Tinnevelly till October to instruct the East Indian lads in the use of the gins, etc. (232.) Dr. Wight should break up his Establishments in Coimbatore immediately. (233.) Gin-houses at Coimbatore and Aroopoocottah to be placed under the Collectors for the use of the Ryots. (234.) Unfounded complaint of the Manchester Association: the Manchester Merchants ought to help themselves.

(235.) State of Dr. Wight's Farm at Coimbatore, May 1849: 500 acres held by contract and 200 acres worked by contract. (236.) Application of Dr. Wight to be permitted to sow and gather one crop more: refused, June. (237.) Departure of Mr. Finnie from the Madras Presidency. (238.) Mr. Finnie's last letter, July 1849: "The gins will always remain idle after Government ceases to use them." (239.) Decision of the Madras Government as regards Dr. Wight, reversed by the Court of Directors, September. (240.) Dr. Wight's services to be retained: Mr. Finnie's dispensed with. (241.) State of the Farms at Coimbatore. (242.) Dr. Wight cultivates American Cotton by irrigation. (243.) Postponement of Dr. Wight's Cotton Report. (244.) Mather's improved Churka. (245.) The Manchester Cottage saw gin. (246.) Twenty four Cottage saw gins received by the Madras Government, 1849. (247.) Report of the Madras Chamber of Commerce: the working of the Cottage saw gin unsatisfactory. (248.) Expense of the Cottage saw gin an inseparable bar to its employment in India. (249.) Dr. Wight reports favourably of the Cottage saw gin. (250.) Prices of the Cottage saw gin to Natives and Europeans. (251.) Favourable report of the Collector of Tanjore: subsequently reversed. (252.) Favourable reports on the Dharwar saw gin. (253.) Dr. Wight compares the working of the Dharwar gin, the Manchester Cottage gin, and the large Hand gin. (254.) Relative cost of labour on the Churka, the Manchester Cottage gin, and the large Hand gin. (255.) Three years' progress in the Cotton Experiment, 1850-52. (256.) Colonel Lawford's cultivation by irrigation in Tanjore. (257.) Mr. Wroughton's Collectorate Farm at Coimbatore. (258.) Mr. Thomas's opinion upon the best method of inducing the Ryots to cultivate American Cotton. (259.) Cotton cultivation by Mr. David Lees in Tinnevelly: discussion concerning the right of Chayroot renters. (260.) Discussion respecting the purchase of American Cotton on Govern-

ment account from the Ryots of Tinnevelly. (261.) Authority for the purchase refused by the Madras Government. (262.) Completion of Dr. Wight's Report, May 1852. CHAP. V.

Dr. Wight's Final Report, 12th May 1852.

(263.) Stage of the Cotton experiment in 1849. (264.) Improved prospects during 1850-51 and 1851-52. (265.) Previous reluctance of the Ryots to cultivate American Cotton connected with the existence of the Cotton Farms. (266.) Ryots encouraged by their own success to extend the cultivation. (267.) Large results in 1850-51 and 1851-52. (268.) Ryots adopt Dr. Wight's practice. (269.) Refutation of the theory that the climate and soil of India are unfitted for American Cotton. (270) First, The theory is founded on the assumption that Indian Cotton has succeeded when the American has failed. (271.) Second, The theory is based upon a comparison of crops grown in India, and of crops grown on the Mississippi instead of those grown in Georgia. (272.) Differences between India and the Mississippi do not prove that the soil of India is inimical to American Cotton. (273.) Soil of Southern India: latter compared with that of Georgia. (274.) Climate of Southern India not so congenial as that of Georgia: evil obviated by sowing in August or September. (275.) Leading principles of Cotton culture in the Carnatic: sowing before the North-east monsoon and selection of soil. (276.) Objection of Native Spinners to the soft and silky fibre of the New Orleans Cotton. (277.) Difficulty of separating the seed from the staple, and prejudice against the seed as food for Cattle. (278.) Nothing wanted to secure receive a rapid extension of the American Cotton culture, but a steady market and competition. (279.) Cotton cultivation on the Coromandel Coast: New Orleans, Sea Island, Egyptian and Brazilian. (280.) Partial success of Mr. David Lees on the sandy Coast lands of Tinnevelly: error as regards deep sowing. (281.) Sandy soils along the Coromandel Coast adapted to the cultivation of American Cotton.

(282.) Sir Henry Pottinger's Government condemns Dr. Wight's report. (283.) Recommends that, as the Farms had proved injurious, and as the Agency was no longer necessary, all Government intervention should be withdrawn. (284.) Dr. Wight's protest against the conclusions of the Madras Government. (285.) First, The Government Farms had not proved injurious, but the groundless suspicions of the Ryots. (286.) Second, The Government Agency had not proved unnecessary as it removed the suspicions of the Ryots. (287.) Retirement of Dr. Wight and final despatch of the Court of Directors, 1853.

CHAPTER V.

DISPUTES BETWEEN DR. WIGHT AND MR. FINNIE, DISCUSSIONS OF THE MADRAS GOVERNMENT AND COURT OF DIRECTORS, AND FINAL CLOSE OF THE EXPERIMENTAL CULTURE.

1847 TO 1853.

Marquis of Tweeddale succeeded by Sir Henry Pottinger: breach between Dr. Wight and Mr. Finnie.—In 1849 the Cotton experiment in India underwent a new phase. The Marquis of Tweeddale had retired from the Government of Madras in 1848; and Sir Henry Pottinger was now Governor of the Presidency. Meantime the differences of opinion between Dr. Wight and Mr. Finnie had broken out into an open rupture. This obsolete quarrel between the Superintendent of the Cotton Farms, and an American Planter originally engaged to act under his instructions, would of course be unworthy of notice, did it not serve to illustrate the stage at which the Cotton experiment had arrived. It will have been seen that the views, and the mode of procedure, of Dr. Wight and Mr. Finnie, were diametrically opposed. Dr. Wight had expressed his belief that American Cotton might be profitably cultivated throughout the Peninsula, excepting on the high table lands, where the climate might prove too cold; and accordingly he had been endeavouring to ascertain by actual experiments, the principles of the cultivation of American Cotton under the conditions of an Indian soil and climate, and the nature and extent of the advantages possessed by the American gin over the Indian churka. Mr. Finnie, on the contrary, had expressed his belief that American Cotton could not be profitably grown in any part of India, excepting perhaps in such isolated spots as enjoyed the benefit of both monsoons; and 210

Para 180.

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Paras 127, 133.

Para 204.

Compare Mr. Finnie's letter, 23rd Dec. 1847, with his letter, 31st May 1848. Parl. Return (1857) p. 276, 292.

accordingly he had only planted a little American Cotton at Courtallum, and engaged a few Ryots to plant a little more at Sevacausey and Aroopoocottah, but from almost the very first had regarded the latter experiment as a failure. Again, Mr. Finnie considered that the American gin, however well adapted to American Cotton, was wholly unsuited to the Indigenous Cotton; first, because its working was too expensive in a country where labour was so cheap; and secondly, because it cut the fibre of the Native Cotton. Accordingly, instead of cultivating "an exotic like American Cotton, in an oasis like Courtallum," and "looking after the working of three miserable gins" at Aroopoocottah, he had devoted himself to the extension of the cultivation of Native grown Cotton, and to the improvement of its quality by methods already available to the Ryots. The point however in which Dr. Wight and Mr. Finnie came into direct collision, was the order of the Court of Directors for the 6000 bales of ginned East India Cotton. Mr. Finnie bought very little Cotton for ginning, on the ground that the price demanded by the Ryots was too high; and he excused himself from ginning to any great extent, on the ground that his three hand gins at Aroopoocottah would not work properly, and that he had not got his gin house and driving machinery erected at Sevacausey. These matters, together with some others, are worthy of being briefly narrated.

Dr. Wight's letter, 26th Oct. 1847. Parl. Return (1857) p. 164.

211 **Mr. Finnie convinced of the folly of cultivating American Cotton in India: Dr. Wight recommends his removal.**—In 1847, Dr. Wight was informed that two of the American Planters, who had returned to England from India, had reported that American Cotton could only be grown in peculiar climates, such as those of Dharwar and Coimbatore. Accordingly, he represented this fact to the Madras Government, declaring it to be a mere hypothetical deduction, based on an imperfect acquaintance with the climates of India;

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adding however, that he should have considered the judgment of no importance, had he not discovered that Dr. Royle had adopted a similar view; and had not Mr. Finnie fallen into the same error, and actually stated in a note, that "he believed he might almost undertake to eat all the American Cotton that would be produced at Aroopoocottah." Accordingly, about three weeks afterwards, Mr. Finnie complained to the Madras Government, that Dr. Wight had accused the American Planters of forming a "conspiracy," for the purpose of discouraging the British public from persevering in the cultivation of American Cotton. The Madras Government however, stated in reply that no such communication had been received from Dr. Wight. Meantime, Mr. Finnie seems to have flavoured his official correspondence with frequent sneers at Dr. Wight's proceedings; and on one occasion, in an official application to Dr. Wight for some American seed, he stated that he was "more and more convinced of the folly of trying to make this country (India) produce American Cotton." In reporting this statement to Government, Dr. Wight pointed out that it involved a grave error. If the expression referred to India generally, it was altogether incorrect; and if it were even limited to Tinnevelly and Madura, still it was contradicted by the fact that good field grown American Cotton had been raised in those districts, both recently, and also in former years by the late Mr. Hughes. Under such circumstances, he was convinced that Mr. Finnie had never given the experiment a fair trial, and that he never intended doing so; and he therefore recommended that Mr. Finnie should be removed from the locality where he had been stationed. "In thirty two months," said Dr. Wight, "he has cost the experiment about 20,000 Rupees, and has not grown one bale of American Cotton, or himself cultivated, or taken continuous charge of, a single field. What he has done in the ginning department towards aiding in making up the Court's order, I know not; but I

Mr. Finnie's letter, 16th Nov. 1847. Parl. Return (1857) p. 278.

Dr. Wight's letter, 2nd June 1848. Parl. Return (1857) p. 181.

Para 33.

CHAP V.

Para 196.

believe very little." In another letter, referring to Mr. Finnie's sample of Tinnevelly Cotton already noticed, Dr. Wight severely commented on Mr. Finnie's inconsistency. It seems that on the 4th of May 1848, Mr. Finnie had consulted Dr. Wight officially, as to what measures he should adopt to overcome the obstinacy of Native dealers in withholding their Cotton at reasonable prices; whilst on the 24th of the same month, only twenty days afterwards, he stated that he had nearly a whole village engaged in producing Cotton of a very superior quality, and pledged himself to have ultimately the whole crop of Tinnevelly cleaned according to his particular pattern.

Dr. Wight's letter, 21st June. 1848. Parl. Return (1857) p. 293.

212 **Points of the dispute: summary of the correspondence.**—The rupture between Dr. Wight and Mr. Finnie began about the time of the change of Governors. Sir Henry Pottinger the new Governor, however, declined to take any notice of Mr. Finnie's sentiments or of Dr. Wight's criticisms; and of course within a few months the correspondence between the two grew warmer and more lengthy than ever. The points in the controversy will now be exhibited in the briefest possible form; just sufficient to illustrate the stage at which the Cotton experiment had arrived in the season of 1848-49.

Sir Henry Pottinger's Minute 15th July 1848. Parl. Return (1857) p. 296.

DISCUSSION BETWEEN Dr. WIGHT AND Mr. FINNIE.

213 **Mr. Finnie to Dr. Wight, 7th November 1848: "I have had great difficulties in ginning, but have induced many Natives to plant American Cotton."**—Having been ordered by the Madras Government to assist you in fulfilling the orders of the Court of Directors for 6000 bales of ginned East Indian Cotton, I have to report that I ginned nine candies last season, and thirty-six candies this season, making forty-five in all. I have however had great difficulties in the way of procuring seed Cotton. Brokers here go themselves to the Ryots to buy the seed Cotton; so

Mr. Finnie's letter, 7th Nov. 1848. Parl. Return (1859) p. 198.

that instead of the Ryots bringing their Cotton to me, as they bring it to you at Coimbatore, I have been compelled to purchase at a high price from the Brokers. The reason of this is obvious. In Coimbatore you are so far from the coast, that there is no local demand; and the people are only too glad to carry their seed Cotton to your gin-house, where they find a purchaser at once. Tinnevelly however is filled with Chitties who purchase for the European agents; whilst there are also numbers of Brokers, who gain their living by churkaeing the Cotton, and who will not see me deprive them of their livelihood without a struggle. I have however got fifty-eight candies of Cotton, cleaned by the churka men; and I submit that the quality is equal to that of ginned Cotton, whilst the staple is far better, and the cost much less. Then again, as regards the working of the gins I have had considerable trouble. The coolies, who turn the wheels, have hitherto refused to work excepting by the day; and I have only just been able to induce them to work by contract at three rupees, or six shillings, per 1000 lbs. of seed Cotton, including threshed work. As regards the gins themselves, I should also like to have the benefit of your suggestions; for, though properly fixed, they will not turn out so much work as yours; and the most we can do with all three is to gin 1760 lbs. of seed Cotton per diem. As regards the introduction of American Cotton, about which you are so anxious, I have the pleasure to mention for your gratification, that I have induced many Natives to plant a little. Some have planted it by itself throughout entire fields; others have sown it with grain; others again have scattered the seed among the Native Cotton, with the hope that the stamina of the American may mingle their pollen with that of the Native plant, and thus gradually produce a hardier plant than the American, and one more productive and of finer staple than the Indian.

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214 **Dr. Wight to Mr. Finnie, 15th November: "Your purchase of Churkaed Cotton is illegal, your culture of American Cotton unsatisfactory, and your ginning too expensive."**—In reply to your letter, I have to notice your purchase of churkaed Cotton, your inducing Natives to plant American Cotton, your sowing two species together to obtain a cross, and your ginning operations. As regards the purchase of churkaed Cotton I can offer no opinion; as the purchase of a marketable article in the bazaar is forbidden by the Company's Charter, and would require the special sanction of Government. As regards your having induced some Natives to grow American Cotton, I am not gratified. You were not sent to Tinnevelly for that purpose, but to show the people how to conduct the culture; and I consider that so long as you stand aloof as a mere looker on, you do not fulfil your obligations to the Madras Government to serve it as an American Planter. For myself I feel satisfied, that the locality you occupy is much more favourable than Coimbatore for the production of New Orleans Cotton; and I think that had the ground been differently occupied during the past three years, the result would have proved more satisfactory there, than it has proved in Coimbatore. But the fact is, that you compromised yourself long ago, by declaring that you were convinced that it was a "folly" to try and make American Cotton grow in Madura or Tinnevelly; and now you will not try, lest you should ruin the reputation you imagine yourself to possess. Whilst however you do nothing, lest you should waste a few rupees of public money; you feel no compunction in inducing the poor Natives to risk their little capital, and their labour, in an undertaking which you confidently pronounce to be hopeless. As regards your expectation, that by sowing the two species of Cotton together you may succeed in obtaining a cross, hardier than the one and more productive than the other;—Ican only say that I can give you but little encouragement,

Dr. Wight's letter, 15th November 1848. Parl. Return (1857) p. 199.

as such a result would be contrary to the laws of nature. To obtain such a cross it would be necessary to open the flower before natural blooming ; to cut out the stamens before shedding their pollen ; and then to apply the pollen of the intended male parent to the virgin stigma. If its own pollen has once been applied, the other will not take effect. But even supposing this to happen, and a cross obtained, we should be no great gainers. The Native Cotton might be improved, but it would be at the expense of the American plant. Already the American Cotton is as hardy as the Indian Cotton, and would only be deteriorated by the cross. As regards the ginning, we pay for manual labour one penny (8 pies) per maund of 25 lbs., or three shillings and four pence per 1000 lbs. One 25 saw gin cleans 1,000 lbs. of seed Cotton in about ten or twelve hours ; and one 19 saw gin cleans 750 lbs. in about the same time. If the working of your gins falls below that standard, either the coolies are deficient in training, or there is something wrong in the gins. This last I apprehend to be the case ; as in examining the alterations you have made in those gins you have returned, I find that you have spoiled both ; thus fully proving that you do not understand the mechanism of the Cotton gin. I would therefore suggest the propriety of sending down an artificer, to ascertain whether the fault in the working of your present gins, lies with the gins or with the coolies.

Mr. Finnie to Dr. Wight, 18th December: "My plans have all been approved by the authorities."— 215

Mr. Finnie's letter, 18th Dec. 1848. Parl. Return (1857) p. 202.

I shall not discuss the subject of the suitability of the American Cotton to India, nor of the American gin to Indian Cotton. I shall simply explain what you have misunderstood, and correct your erroneous views. You now remark that the purchase of bazaar Cotton is prohibited by the charter ; but in 1846 you recommended the purchase of

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such Cotton as was ordinarily churkaed by the people. As regards my proceedings in the cultivation of American Cotton, I have strictly adhered to the plans which I proposed in my letter of the 26th January 1846, to which you made no objection. In deference however to your views, and contrary to my own judgment, I recommended the establishment of a Cotton plantation in May last, but did not obtain the sanction of Government. How then can you say that I stand aloof as a mere looker on, and that I do not fulfil my obligations to serve the Madras Government as a Cotton Planter? I consider that the main object of my mission here is, to improve the Native Cotton, and at the same time to do what I can to introduce the exotic. In the first, which is my primary purpose, I have been most successful; and I was told by the gentlemen of Tuticorin, that more good Cotton had been there during the last season than was ever known before. As regards the secondary subject of the introduction of American Cotton into India, what more can be wanted than to see the cultivation in the hands of the Ryots? I have agreed to pay them two Rupees (4s) per month for each acre, during the two or three months that embrace the cultivating season; and also to give them two Rupees (4s) above the market per podhee of 240 lbs. in the seed, or five Rupees (10s) above the market price per candy of 500 lbs. of clean Cotton. If the business succeeds in the hands of the Ryots, they will extend the culture; if it fails after a fair trial, then the experiment will be for ever set at rest. As regards what I have done in the way of cultivating American Cotton, I may remark in the first place, that my hope of producing a cross by mixing the American and Native varieties, involves no very serious ground of dispute: in all points where botany is concerned, I yield to your superior knowledge. Secondly, I may remark that I have planted the American Cotton in every possible way, but it all looks wretched; except some that is sown in Red land

Paras 127, 131.

Para. 203.

among palmyra trees, and those that are most protected by the hedge look the best. I merely state these as facts, and base nothing on them either for or against the success of the plant in this country. Both the Red and Black lands, especially if well manured, would produce Cotton, if at the same time they enjoyed the climate of Mississippi. You say that this locality (Tinnevelly and Madura) is more favourable for the culture of American Cotton than the vicinity of Coimbatore. But this is opposed to your own reports. Here the soil is Black, and you have always asserted that the Black land is unsuited for the American Cotton; and it was on this very account that you removed your experimental farms to a locality where there is nothing but Red land, and which moreover has the benefit of both monsoons. How then can you assert that the plant will grow here in Black land, which only enjoys the benefit of one scanty monsoon? I think that an experiment of seven years, like yours at Coimbatore, is amply sufficient; and I hope Government will send you out in the open plains to try your skill in the Black and Red soils with only one monsoon. If the culture of American Cotton is ever to confer the expected benefit on India and England, we must get out of the little oases at the foot of the hills, and spread it over the length and breadth of the land. As regard the gins, the band did not run properly, and the Ryot in charge made them carry a leathern rope instead; but I deny that either of the gins were in any way injured.

Dr. Wight's explanations, 30th January.—You are correct in saying that in 1846 I recommended the purchase of churka cleaned Cotton, in order that it might be tried together with ginned Cotton by English spinners. This suggestion was approved both by the Madras Government and the Court of Directors; but at the same time the Court directed that seed Cotton should be purchased by us, and then cleaned by us, partly by the gin and partly by the churka; observ- 216

Dr. Wight's letter, 30th Jan. 1849. Parl. Return (1857) p. 205.

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ing, as I presume, that the purchase of the ready prepared marketable article would change the character of the transaction from an experimental to a commercial one, and thereby involve our Honorable Masters in an illegal proceeding. This was the reason why I recommended you to apply for fresh instructions, before engaging in a transaction which might bring the Government into collision with the mercantile interest, as being a departure from the provisions of an Act of Parliament. As regards the establishment of Cotton farms in Tinnevelly and Madura, I learn that you readily obtained sanction for the establishment of a small model farm of fifty acres at Courtallum. Had you asked for a similar one at Aroopoocottah, in order to teach the Natives how to cultivate American Cotton, you would easily have obtained it. If however you applied for a farm of 500 or 1,000 acres, I can easily understand why it was not granted. As regards the two monsoons, it was you who laid such great stress on the importance of this condition in the cultivation of American Cotton in India. I was formerly, to some extent, of the same way of thinking; but now I am convinced that the opinion
Para 90. is most erroneous. You propose that I should be sent into the plains, to try my skill in cultivating American Cotton on Black and Red soils with only one monsoon. To this I am most agreeable. I have long wished to have the experiment tried; and indeed supported your application for employment under this Presidency, for the express purpose of having it tried by a skilful and zealous Planter. At that time you promised me your energetic support. However, a volunteer in the person of the Acting Collector of Tanjore, is now kindly giving me the aid which you then promised to me. He writes me, on the 6th December, "that American Cotton seed, sown early in September, is wonderfully fine; plants up to 2½ feet and 3½ feet high, and loaded with bolls, and only waiting for the bright sunshine to burst. That sown in the beginning of October is just now opening into flower,

and is only about one foot high, evidently kept back by the heavy monsoon." As regards the alterations you made in the gins, they were not small matters as you represent. The position of the brush pulleys was altered; and the result was that one gin revolved the wrong way, whilst the other required six men instead of four to work it. In fact, you injured their working properties, and then complained of their inefficiency.

General opinions of the Madras Government and Court of Directors upon the Experimental Culture.—The foregoing correspondence was forwarded to the Madras Government by Dr. Wight; but by this time the whole question of the advisability of continuing the Cotton experiment in any form, was being brought under the consideration of the authorities. The whole cost of the experiment, which in 1847 had reached two lakhs and a half, or £25,000, had now in 1849 reached to very nearly four lakhs or £ 40,000; though from this sum total must be deducted about half a lakh, or £ 5,000, for money received as the sale proceeds of Cotton shipped to England, and the value of saw gins, and other machinery. At the same time, though much information had been obtained, it did not appear that many practical results had been obtained. The action of Government upon the matter, can be best understood; first by noticing the recorded opinions of the Marquis of Tweeddale, and the remarks of the Court of Directors thereon; and, secondly, by bringing forward the views of Sir Henry Pottinger, which led to the temporary abandonment of the experimental culture in this Presidency. 217

Statements of the Accountant General. Parl. Return (1857) p. 139.

VIEWS OF THE MARQUIS OF TWEEDDALE.

Minute of the Marquis of Tweeddale in 1847: 1st, To relinquish the Experimental Farm in Coimbatore.—It has already been seen that either the Marquis of Tweeddale had adopted the views of Mr. Finnie, or 218

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else that Mr. Finnie had adopted the views of the Marquis of Tweeddale. Accordingly his Lordship had on more than one occasion expressed himself favourably disposed towards the practical suggestions of the American Planter, rather than towards the theoretical views of a scientific botanist like Dr. Wight. Shortly before his Lordship's retirement from the Government of Madras, he drew up several Minutes, in which he recorded his opinions at length. In the first place he proposed the remission of one fourth of the rent of all lands taken up for the cultivation of American Cotton; but this subject has already been narrated elsewhere. His more important proposition was that the Government should immediately relinquish all its Experimental Farms and official agency for raising Cotton. No fair conclusion, he said, could ever be drawn, until private capital and enterprise were embarked in the trial; and that would never take place, so long as Government occupied itself with the experiment. On the other hand, if one half of the amount that had been expended, had been offered as a bonus to private enterprise,—either in the form of advances for the erection of gins and other machinery, or in that of grants of land rent free for a specified term,—he believed that the question would already have been brought to an issue. Again, no fair conclusion could be drawn from a Government Farm, superintended by men who were not practical agriculturists, and who consequently were not able to direct the labour of those under them; but who used Government capital and Commissariat cattle, which the Native cultivator could not command; and who moreover had no direct interest in the success of the experiment, nor in the limitation of the expenditure. His Lordship did not include Mr. Finnie in these remarks, as he believed it to be a great advantage to Government, to be able to command the services of a practical Cotton Planter. At the same time he expressed an opinion similar to that expressed by Mr. Finnie; namely, that instead of attempting to force on the Ryots the cultivation of American

Paras 121, 123.

Marquis of Tweeddale's Minute, 3rd Sept. 1847. Parl. Return (1857) p. 158.

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Cotton, efforts should be directed towards the improvement of the Cotton already cultivated in the country.

2nd, To establish small model fields, under a practical Agency, amongst the Native cultivators.—With these views, the Marquis of Tweeddale advocated the establishment of an Agency, confined to practical Planters. He would not place large Farms in their hands, but a few small patches of land, as model fields, in the midst of the Native cultivation. He believed that it was not the soil, nor the plant, nor the land tax, which shut the Indian Cotton out of the European markets; but that it was want of skill, and ignorance of practical causes. Accordingly, he would urge on the Collectors and their Assistants, the expediency of acquiring from the American Planter a practical knowledge of Cotton culture. He would also urge on the Agents themselves, the importance of improving all the species of Cotton which were already cultivated in India, and of inducing Native agriculturists gradually to adopt those approved and inexpensive modes of culture, which could easily be engrafted on his own.* 219

Marquis of Tweeddale's Minute, 11th Dec. 1847. 'Parl. Return (1857) p. 169.

3rd, To set up small gin establishments, and to keep up good roads to the Ports.—These efforts to improve the culture of Native Cotton ought to be accompanied by more economical and experienced methods of gathering and cleaning the crop, and in preparing it for the market. 220

* The Marquis of Tweeddale's proposition for the improvement of Native Cotton, was communicated to his Excellency Sir William Denison, who thus describes the process suggested, in a Minute dated 29th October 1861. " From the seed pods of this year's crop take out those seeds to which the longest fibres are attached, establishing a minimum length of fibre, and throwing away all those seeds the Cotton of which does not reach this standard; these selected seeds will be used for the next crop, and a similar process will be followed with this, the minimum length being increased every year. In this way, in the course of a few years, it is probable that a permanent addition will be made to the length and possibly to the fineness of the fibre, and it will then be easy to spread the seed of the improved kind over the whole of the Indigenous Cotton fields of India."

CHAP. V. Improvements in this direction should be effected, not by large and costly gin houses, like that erected at Coimbatore, but by small establishments set up in each Cotton locality. The gins should be of simple construction, and should be provided at the cost of the Government, until the people adopted them; after which the Government should immediately withdraw. Again, it must be borne in mind that although foreign substitutes for cleaning Cotton are most valuable, yet the Native means of hand-picking, in a country where so many women and children belong to the cultivators, will always constitute an essential element in preparing Cotton wool for the Indian market. But besides this improved system of culture, and improved means of gathering and cleaning the crop, it is essential that the Madras Government should, where there is no water carriage, create good roads from the Cotton districts to the several Ports, in order to give the Cotton of Southern India a chance of competing in Europe with the produce of other countries.

221 **Limits to Government agency: the Manufacturer should purchase direct from the Ryot.**—The Marquis of Tweeddale expressed his opinion that the Government could effect nothing beyond the three objects already laid down; viz., an improved system of cultivation, better and cheaper means of preparing the Cotton for the market, and better communications to the marts or Ports. But even these, he considered, would fail to secure the desired end, unless the manufacturer or his agent were placed in immediate communication with the cultivator, and purchased direct from him. He drew attention to Mr. Finnie's statements already noticed, that inferior and dirty Cotton was the more profitable article to the Native dealer, and even to the European merchant; and that consequently their interests were not identical with those of the manufacturers or of the Government. The object of the manufacturer was to raise and bring into the market an article of such quality,

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and at such a cost, as might stand in permanent competition with American Cotton. Whereas, the object of the merchant and Agent was to obtain immediate profits during the current year. If the inferior article yielded a better profit to the merchant than the selected article, the merchant would doubtless take it to any extent off the hands of the Ryot and Native dealer. Under such a system it was impossible to obtain for Indian Cotton a permanent footing and hold in the market. It would either be an unsaleable drug, or else would only fetch unremunerative prices; except during those occasional seasons when the American crop may be below the average, and consequently when there may be an enlarged demand by the manufacturer. To meet this state of things, the manufacturer must have his own Agent, who thoroughly knows what article is required, and who cannot be imposed upon by Native dealers to take an inferior article. At the same time, the Agent must be prepared to offer such an additional price to the Ryot or dealer for the superior and well cleaned Cotton wool, as will remunerate him for the additional trouble that has been taken in the improved culture and preparation of the article. If this demand be a steady one, and such as the Ryot may depend upon, the superior article required will be produced at a cost which the manufacturer can afford to pay; and, within a few years, to an extent which is now but little anticipated.

VIEWS OF THE COURT OF DIRECTORS.

Despatch of the Court of Directors, 1848.—These 222
propositions of the Marquis of Tweeddale, together with some others which have been already noticed, were treated at length in a despatch from the Court of Directors. In this despatch the Directors decided; 1st, That there should be no reduction of the assessment on lands cultivated with

General letter from the Directors, 4th July 1848. Parl. Return (1857) p. 179.

CHAP. V. American Cotton, as proposed by Dr. Wight; 2nd, That Mr. Finnie should not be deputed to England to enter into direct communication with the English manufacturers; and 3rd, They recorded their decision upon the proposition of the Marquis of Tweeddale,—to relinquish the Government Cotton Farm at Coimbatore and to confine the agency to practical Planters,—in the two following paragraphs.

223 **1st. The Cotton Farm at Coimbatore may be relinquished: it has been proved that the right Cotton can be grown, and the price alone remains to be ascertained.**—"We concur in your opinion of the expediency of "relinquishing the Government Cotton Farm at Coimbatore. We consider that the object for which this Farm "was established has now been fully attained, by demonstrating that the soil and climate of that province are "capable of producing Cotton of a description in every way "suited to the wants of the English manufacturers. The "point which requires solution is, whether Cotton of this "description can be produced at such a cost as to enable it "to compete successfully with the Cotton of America in the "home market. This point can only be satisfactorily settled "by leaving the cultivation in the hands of the Ryots: "and not even an approximation to it will be obtained, "by carrying on the cultivation at the expense of Government, and under the superintendence of Government Officers. The Government should, however, continue to afford "its aid by distributing American seed, either gratuitously or "at a trifling charge, to those willing to cultivate it; by authorizing the grant of small prizes for its successful cultivation, as we observe you have already done; and by using "all the means in your power to introduce improved methods of cleaning the Cotton from the seed, without injury "to the staple."

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2nd, " Agency confined to practical planters" may be tried on a small scale.—" The " Agency confined to " practical planters," which you propose to substitute for " the Experimental Farms, is not clearly explained ; but we " gather from the Marquis of Tweeddale's minute of the " 11th December 1847, that he would have " small establish- " ments in each Cotton locality" ; or, as he elsewhere ex- " presses it, " small patches of land, as Model Farms in the " midst of the Native cultivation." If the object of this " measure be to ascertain by actual experiment, whether in " any particular locality the soil and climate are suited to " the production of the American, or any other description " of Cotton, we see no objection to its being tried on a small " scale. It appears to us, however, that much information " bearing on this point will be obtained, when the results " of the experiments which you have authorized Dr. Wight " to institute through the several Collectors of land revenue, " with the view of ascertaining the most advantageous time " for sowing American Cotton, shall be reported." 224

VIEWS OF SIR HENRY POTTINGER.

Minute of Sir Henry Pottinger, May 1849.—Sir Henry Pottinger arrived in Madras on the 7th April 1848. On the 15th July he penned a Minute upon the Cotton experiment, which was chiefly confined to approving of Dr. Wight's offering an enhanced price for New Orleans Cotton grown in India ; and to sanctioning the establishment of five small threshers and presses in different parts of Tinnevelly and Madura for the use of Mr. Finnie. At the same time, Sir Henry Pottinger expressed a confirmed opinion that however satisfactory the apparent out-turn of public agency might be,—whether through Government Farms or through purchases on behalf of Government,—that out-turn would form no criterion whereby to judge of the future; because the moment the public agency ceased, 225

Sir Henry Pottinger's Minute 15th July 1848. Parl. Return (1857) p. 297.

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the stimulus would be exhausted, and every trace of it would disappear. He added that Government did all that could be done to obtain the desired object, when it encouraged the people to exert themselves, and placed amongst them qualified persons to advise and instruct them in cultivating, cleaning, and preparing their Cotton. Shortly after penning this Minute, the Court's dispatch of the 4th July must have arrived at Madras; but some delay arose from the necessity of considering what arrangement should be made on the cessation of Dr. Wight's functions as Superintendent of the Cotton Farms.* At last on the 4th May 1849, about nine months after the receipt of the Court's dispatch, Sir Henry Pottinger recorded his final decisions in a Minute, the points of which may be exhibited in the following form.

Sir Henry Pottinger's Minute, 4th May 1849. Parl. Return (1857) p. 209.

226 **The Experimental Farms have been fully tried, and their continuance would be injurious.**—The time has now arrived for the Government to decide finally, whether or no it will continue the Experimental Farms, and the employment of Dr. Wight and Mr. Finnie, and their subordinates. The Court of Directors has distinctly intimated its concurrence with the views of this Government, that the Cotton Farm at Coimbatore should be abandoned; and we might have acted upon that intimation at once, only I have been anxious to look narrowly into the whole question once again, in order to propose the outline of an arrangement for the future. I may here state, that from a careful perusal of the whole of the papers, I am perfectly convinced that both the East India Company and the Madras Government, have done all that was either requisite or called for, to give to these

* It will be presently seen that the Madras Government partly misunderstood the terms of the Court's dispatch. The Directors were desirous only of relinquishing the Cotton Farm at Coimbatore; not of removing Dr. Wight from his position of Superintendent of the Cotton Experiment.

Experimental Farms the fairest, fullest, and most liberal trial; and I am therefore satisfied, not only that they should be discontinued, but that their further continuance would prove injurious to the cause they were intended to promote; inasmuch as it would lead the Ryots to believe that Government alone possessed the means and faculty of either raising the American Cotton, or of improving the culture and quality of the Cotton of the country. CHAP. V.

American Cotton in any part of the Madras Presidency liable to failure.—The Experimental Farms have undeniably established the fact that American Cotton can be grown in the Madras Presidency, and that it will occasionally produce remunerative crops; but I am strongly impressed with the view that it will in all cases be liable to failure from the unsuitableness of climate and soil. The American Planters indeed have gone farther, and have pronounced that the experiment in this Presidency is altogether hopeless; and not one of them has ever supported the sanguine hopes and predictions of Dr. Wight or Mr. Wroughton. However, the period for predictions and prospects has passed away; and the Farms themselves have merged into a mere mercantile speculation. 227

Causes of the failure of American Cotton: climate and soil.—It would be useless, and indeed I am not qualified, to discuss at length the causes of the failure. I believe that the failure is to be ascribed to the natural defects of climate and soil, and especially to the former. I appeal to all persons, who have practically studied the subject for any length of time in India, to say whether such defects are not often unaccountably insurmountable; and whether, even when they are overcome, the success is not to be attributed to some secret working of nature which it is impossible to fathom. I have never attempted the cultivation of Cotton, but I have been a very successful practical gardener in 228

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various parts of India; and I have constantly found it impossible to bring to perfection in one place, the plants which flourished most luxuriantly in another. Who for instance can explain why the delicious Mangostein is confined to a small circle in the Straits of Malacca? Why the Maize, which in every part of India requires unceasing irrigation, will yet grow as a dry crop on the hills in the vicinity of Nankin? Why the Pumplenoses (West Indian Shaddock) which grew in my garden at Bhooj, in the rich and proverbially hot climate of Kutch, were far superior, both in size and flavour, to any that I have ever seen either at Bombay or on the coast of Malabar?

229 **Dr. Wight ascribes the failure in Coimbatore to the want of humidity, but humidity does not mean rain.**—I see that Dr. Wight attributes the failure of the American Cotton in Coimbatore to the want of humidity; and I understand him to signify that the humidity of a climate depends upon the quantity of rain that falls. To this definition I beg to differ. The climate of the lower parts of Scinde is for some months the most humid I ever lived in; and yet the rain, beyond a few showers, does not usually fall in more than one year out of three or four. I believe also that there are other regions of the globe to which the same remark may be still more forcibly applied.

230 **The Ryots should now be left to themselves, with such aid as the Revenue Establishments may give.** —I have made the foregoing remarks to show that I have not taken a superficial view of this important question. I give Dr. Wight the highest credit for his zeal and perseverance; but had he even effected greater results than he has done, I should still think that the Ryots ought now to be left to themselves. The Ryots however will still have the advantage of such advice and instruction as can be given them through the Collectors and Revenue establishments;

and I propose that, after the departure of Dr. Wight, his two subordinate assistants, Messrs. Sherman and Cuxton, together with the East Indian lads who have been in his service, should be attached to the Revenue establishments, at least for a time. Accordingly, the arrangements I now propose for Mr. Finnie, Dr. Wight, and the subordinates are as follows.

Mr. Finnie to remain in Tinnevelly till October, to instruct the East Indian lads in the use of the Gins, etc.—Mr. Finnie's engagement with the East India Company terminates in October next. He should therefore remain in Tinnevelly until that time, under the orders of the Officiating Collector. He should at once desist from all further purchases of Cotton. He should also cease to interfere with the culture of Cotton, beyond giving his advice when asked for; because if he should tender his advice, and the crop should afterwards fail, the failure would be attributed to his innovations. He should be ordered to devote his whole time and attention to the instruction of the Natives in the practical use of the gins, presses, churkas, threshers, and other implements required in the cleaning and preparation of the Cotton. One half of the East Indian lads now under Dr. Wight in Coimbatore, should be at once removed to Tinnevelly, and placed under the instructions of Mr. Finnie; so that when Mr. Finnie retires, they will be able to take charge of all the Cotton machines. 231

Dr. Wight should break up his establishment in Coimbatore immediately.—Dr. Wight should discharge at once all establishments which have been hitherto employed on the Experimental Farms; and place his two assistants, Messrs. Sherman and Cuxton, and the remaining half of the East Indian lads, at the disposal of the Collector of Coimbatore. 232

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233 **Gin-houses at Coimbatore and Aroopoocottah to be placed under the Collectors for the use of the Ryots.**—After the departure of Mr. Finnie, either Mr. Sherman or Mr. Cuxton should be transferred to Tinnevelly. Thus whilst the gin-houses at Coimbatore and Aroopoocottah will be under the general superintendence of the Collectors of the district, each one will be in the immediate charge of either Mr. Sherman or Mr. Cuxton. The Ryots should, for a season at least, have the use of these gin-houses gratis, as well as the use of all other agricultural and Cotton cleaning instruments, which have been so profusely and readily supplied by the Court of Directors. But I do not deem it either necessary or desirable that this system should be considered a permanent one; and both the Collectors of Coimbatore and Tinnevelly will be expected to report to Government, when they consider that the time has arrived for requiring from the Ryots a trifling sum for the use of the Government instruments and machinery. The sole occupation of Mr. Sherman and Mr. Cuxton in their several districts, will be to overlook the proceedings of the East Indian lads; who, it is assumed, will be fully qualified to take charge of the Cotton cleaning apparatus. The Revenue authorities will, on their part, be most careful to guard against any one of the assistants or employers from receiving, on any pretence whatever, the smallest private gratification or present for work done with the public machinery.

234 **Unfounded complaint of the Manchester Association: the Manchester Merchants ought to help themselves.**—I have observed that the Manchester Commercial Association has recently stated, that it has been satisfactorily proved that New Orleans Cotton can be produced cheaply and profitably; and that if the same amount of encouragement had been afforded in Coimbatore, as had been given in Dharwar, far greater quantities would have

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been produced. To both assertions I most unhesitatingly demur. Small batches of excellent Cotton wool have been occasionally sent to England from Coimbatore, but they formed the exception and not the rule; and as regards the alleged absence of insufficient encouragement, I am sure that no one who has taken the trouble that I have done, to obtain a perfect insight into the whole matter, will for an instant admit the correctness or applicability of the accusation. My own decided sentiments are that the Manchester Merchants must blame themselves, if there should be any inadequacy in the future supply; unless they come forward, as they have been repeatedly urged to do, and apply their own agents and capital to the task, in which Government has set them the example, and pointed out, according to their own showing, so easy a course.

State of Dr. Wight's Farm at Coimbatore, May 1849: 500 acres held by lease and 200 acres worked by contract.—Whilst Sir Henry Pottinger's Minute was still under the consideration of the other Members of Government, and whilst Dr. Wight and Mr. Finnie were as yet ignorant of the fate in store for them, Dr. Wight happened to visit Madras, and to call at the office of Sir Henry Montgomery, the Chief Secretary. Accordingly, Sir Henry Montgomery took the opportunity of asking Dr. Wight to explain the exact state of his department at that moment. Dr. Wight represented that he had about 500 acres of land, all ploughed and ready for seed. Part of this land consisted of waste; and part was rented from Ryots, who themselves held the land on puttah or lease from the Government, under the ordinary system of Ryotwary tenure. As regards these last lands, Dr. Wight had agreed to pay the Government assessment, and something more to the Ryot as compensation; that is, half as much 235

Memorandum by Sir Henry Montgomery, 11th May 1849. Parl. Return (1857) p. 211.

CHAP. V. more on dry land, and twice as much more on garden land.* The whole of these 500 acres was worked by his Farm establishment and cattle; but in addition, he was preparing about 200 acres to be cultivated by Native labourers employing their Native implements and cattle on the contract system. The ploughing for the season had already been completed; and he proposed to sow the land in two months time, that is in July, with three different kinds of American seed; and also with some Sea Island seed lately received from the Court of Directors. The Court's order for six thousand bales was about half executed; and Dr. Wight continued to purchase Native seed Cotton, and to gin it, as it kept the gin house Cattle at work, and the ginned Cotton yielded a profit of 20 or 25 per cent. on cost and charges. He had 100 bales of ginned Native Cotton at Cochin ready for shipment; and 8000 rupees worth of seed Cotton, purchased at Coimbatore, was being ginned as rapidly as possible. As regarded the culture of the coming season, Dr. Wight calculated that it would pay all the agricultural expenses of the Farm, exclusive of his own salary; and he considered that, now that the sowing time had been changed from the cold weather to July, the American Cotton could no longer be regarded as an uncertain crop.

236 **Application of Dr. Wight to be permitted to sow and gather one crop more: refused, June.**—It will be seen from the foregoing para, that Dr. Wight was under contract both to Native landholders and to Native cultivators; and that the land had been engaged, and compensation paid, up to May 1850. Accordingly one of the Members

* All lands under a system of artificial irrigation are called *nunjah* or garden lands. Those under no irrigation, beyond what is supplied by the natural fall of rain, are called *punjah* or dry land. The Native Cotton is generally grown on dry land or *punjah*. Dr. Wight however had been anxious to try the experiment of growing American Cotton on *nunjah*, or irrigated land. It need scarcely be remarked that a higher rate of assessment is raised from *nunjah* than from *punjah* land.

of Council suggested that the land might be worked during the coming season, but not beyond the season. Sir Henry Pottinger however insisted upon the immediate transfer of the Farm to the Collector; and he expressed his surprise that Dr. Wight, who had once recommended a remission of half the land assessment, should now have actually agreed to pay, not merely the whole of that assessment, but an additional compensation of one half more, and in some cases a rent amounting in the aggregate to double the assessment;—a proceeding which it was impossible for the people to understand, and which could only deter them from competing with the Government who possessed such a command of money and means. The Government order was then drafted in accordance with Sir Henry Pottinger's first recommendations. Dr. Wight appealed. He explained that when procurable he had obtained Government waste land; but that otherwise he had been compelled to rent lands of the Puttahdars, or Ryots, who were to all intents and purposes, proprietors of the land. This practice had been in force prior to his undertaking the charge of the Farms at Coimbatore, and was altogether unavoidable; as the lands could not be obtained without the payment of compensation to the Ryots, and the amount of compensation had been fixed before he was appointed. Dr. Wight also represented that his Farm had been repeatedly ploughed for the coming season, and that consequently from two-thirds to three-fourths of the expense had been already iucurred; all of which would be lost unless the crop was grown. He added that this pecuniary loss would be small in comparison with those injurious effects on the agricultural community, which were likely to follow the abrupt breaking up of an establishment, which had been in operation for many years, and when it was generally known that nearly all the expenses of the crop had been incurred. He therefore begged that the establishment might be kept up for one season long-

Mr. D. Elliott's Minute, 12th May 1849. Parl. Return (1857) p. 213.

Para 121.

Sir Henry Pottinger's Memorandum, 12th May 1849. Parl. Return (1857) p. 212.

Minutes of Consultation, 1st June 1849. Parl. Return (1857) p. 213.

Dr. Wight's letter, 11th June 1849. Parl. Return (1857) p. 216.

Para 39.

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CHAP. V. er. By so doing all these disadvantages might be avoided; the excellent and thoroughly acclimated stock of seed would be preserved; and some arrangements might be made for others, such as the Manchester Association, to continue the experiment on their own account. The Governor in Council however decided that the Cotton Farm should be at once transferred to the Collector, who would carry out all that was necessary in consequence of the engagements which Dr. Wight had made.

Minutes of Consultation, 29th June 1849. Parl. Return (1857) p. 218.

237 **Departure of Mr. Finnie from the Madras Presidency.**—Such was the sweeping measure carried out by Sir Henry Pottinger's Government in June 1849. We shall presently see that as far as Dr. Wight was concerned, the measure was reversed by the Court of Directors; but the proceedings as regarded Mr. Finnie were fully confirmed. The latter gentleman left the Presidency in the following October, but before his departure from Tinnevelly, he addressed a letter to Mr. Elton the Collector of the District, respecting the directions which he had received from Government to instruct the East Indian lads in the working of the gins, and concluding with a general review or estimate of his own labours.

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238 **Mr. Finnie's last letter, July 1849:—"The gins will always remain idle after Government ceases to use them."**—Mr. Finnie reported that he should be happy to instruct Dr. Wight's East Indian lads in the working of the gins, during the fifteen or twenty days that were required to clean the seed Cotton on hand; but that after that period the gins would never be at work, as the Natives would never use them after Government had retired from the experiment. So long, he said, as the merchants continued to buy dirty Cotton, so long we must despair of all improve-

Mr. Finnie's letter 17th July 1849. Parl. Return (1857) p. 304.

ment. Even the hopes which he had entertained the previous year, that the people would take more care in cleaning and packing, had proved altogether abortive; for during the greater part of the season they had realized as much for the dirty Cotton, as he had given them in the early part of the season for the clean Cotton. Under such circumstances, all his efforts to induce the people to employ the gins had of course proved a failure. He had offered them the use of the machines for a mere trifle, and then for nothing; but they utterly refused to have any thing to do with them; "and the gin house at Sevacausey, and the Ceylon machinery, will remain a cenotaph to the judgment of those who urged the purchase after I had ascertained that they were not required." Mr. Finnie concluded his letter with the following expressions, which are worthy of preservation, as exhibiting his own estimate of his labours. "I have not," he said, "confined myself to the track pointed out by pseudo-" scientific theory, but have launched boldly into the broad" ocean of practical utility, guided by the north star of com-" mon sense, which, with some knowledge of political econo-" my, with due regard to cause and effect, enables me to" draw approximate conclusions as to the results of certain" plain measures in reference to national internal improve-" ment and individual prosperity. My only regret is that" I have done so little; that I have accomplished nothing" for the benefit of this country and its Ryots; but I have" done my best, and I can now return to my Native land" with the proud satisfaction of having discharged my duty" to my employers." These were apparently the last words of Mr. Finnie. It is however currently reported that Mr. Finnie's last words were of a very different complexion; and were to the effect that he owed it, as a duty to his country, to prove that American Cotton would *not* grow in Southern India, and that this latter duty was the one which he considered he had fully performed.

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Para 187.

Personal information.

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239 **Decision of the Madras Government as regards Dr. Wight, reversed by the Court of Directors, September.**—The proceedings of Sir Henry Pottinger's Government as regarded Dr. Wight, seem to have been altogether opposed to the wishes of the Court of Directors. Immediately after the receipt of the proceedings, the Court sent out a dispatch, in which they ordered a reversal of the resolutions which had been passed by the Governor in Council. They were of opinion that, under the circumstances mentioned by Dr. Wight, it would have been desirable to avoid the abrupt termination of his arrangements. They had previously concurred in the opinion that the Government Cotton Farm in Coimbatore might be relinquished, because they had considered that the object for which that Farm had been established had been fully attained, "by demonstrating that the soil and climate of the Coimbatore district "were capable of producing Cotton of a description in every "respect suited to the wants of the British manufacturer." But at the same time, they had directed that the Madras Government should continue the distribution of American seed; and they had authorized the cultivation of fields in particular localities, with the view of ascertaining whether the soil and climate of those localities were suited to the production of the American, or any other description of Cotton. Whilst therefore they had believed that the time had arrived for discontinuing the extensive farming operations at Coimbatore, they had not intended to prohibit the cultivation on a small scale on account of Government. Again, they had expressly ordered that Dr. Wight's purchases of American Cotton from the Ryots at remunerating prices should not be discontinued; and it was neither their wish, nor their intention, that Dr. Wight should be removed from the Office of Superintendent of Cotton Experiments under the Madras Presidency. Accordingly, the Directors expressed their regret that the Madras Government should

Dispatch from the Court of Directors, 5th Sept. 1849. Parl. Return (1857) p. 226.

have adopted a course, which could scarcely fail to produce an impression, both in India and in England, that they had become less earnest in promoting the object, equally important to both countries, of obtaining from India a supply of Cotton suited to the requirements of the English manufacturers.

Dr. Wight's services to be retained: Mr. Finnie's dispensed with.—The Court of Directors then ordered that the Coimbatore Farms should, if not too late, be cultivated according to the plans laid down by Dr. Wight; and that at the close of the season, both the lands, and the machines and implements, should be delivered over at a fair valuation to any company of Merchants and Planters who might offer to continue the experiment. As regarded Dr. Wight, they considered that before giving up the superintendence of the Cotton experiments, he should be called upon to furnish a clear and connected account of the experimental cultivation on the Coimbatore Farms, and in other parts of the Madras Presidency; together with such observations as his scientific and practical knowledge might enable him to supply as to the causes of success or failure. Such a report, they said, could not fail to be a useful document, as a guide for those who might be hereafter engaged in similar undertakings. As regarded leaving future operations in the hands of the Collectors, the Directors remarked that little could be accomplished by those officers, unless the latter could look to some properly qualified officer to direct their proceedings, and to digest and methodize such results as might be obtained. Again, considerable advantage was to be expected from the experiments which had been in progress under the superintendence of Dr. Wight throughout the Presidency, with the view of ascertaining the most suitable time in the year for sowing the American seed; and such experiments would be of little avail, unless the officer, by whose suggestions they 240

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had been undertaken, should be in a position to examine and report on these results, aided by his own extensive experience in the practical cultivation of Cotton in other localities. Accordingly, the Directors expressed their opinion, that Dr. Wight should retain the position of Superintendent of Cotton Experiments under the Madras Presidency, until these objects were accomplished; but at the same time they approved of the decision of the Madras Government to dispense with the services of Mr. Finnie at the termination of his engagement. Mr. Finnie, as we have already seen, left the Madras Presidency in October this year.

Para 237.

241 **State of the Farms at Coimbatore.**—Meantime, Dr. Wight was staying at Madras preparatory to retiring from the service; but on receipt of instructions from the Madras Government to resume his office of Superintendent of the Cotton Experiment, he at once repaired to Coimbatore, and placed himself in communication with Mr. Thomas, the Collector of the district. The lands he had rented, as described in a previous paragraph, had all been given up to the Ryots, except two or three fields which had been taken up by a Cape Farmer named Prince, who had visited Coimbatore in order to receive instructions in Cotton culture, and who but for that accommodation must have returned without attaining the object of his mission.

Dr. Wight's letter, 6th Nov. 1849. Parl. Return (1857) p. 231.

Para 235.

242 **Dr. Wight cultivates American Cotton by irrigation.**—As the season was too late for Dr. Wight to cultivate American Cotton as a dry crop, he resolved to try the plan of cultivating both Native and American Cotton by the aid of irrigation, as proposed in his Circular of the previous March. Accordingly he rented several garden lands, or lands under irrigation; and he proposed to have them cultivated under his direction by the proprietors of the lands, for the purpose of familiarising them with his practice. In these gardens he proposed to sow every variety of

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Cotton seed which he had in his possession; namely, Sea Island and Bourbon of the long stapled varieties; and New Orleans, Petit Gulph, and Native Cotton of the short stapled varieties. Dr. Wight had also written to Mr. Cuxton in Tinnevelly, to ascertain the capabilities of the climate on the South-eastern coast for the production of American Cotton by a similar course of procedure.

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Postponement of Dr. Wight's Cotton Report.—The clear and connected account of the experimental cultivation on the Coimbatore and other Farms, which the Court of Directors had called on Dr. Wight to supply, was postponed for a while until the latter could obtain further materials. Upon this point Dr. Wight observed that such a report, to be really useful and satisfactory, must be comprehensive, embodying both principles and practical details. Accordingly, the completion of the Report was delayed for two years and a half, and was not finally addressed to the Madras Government until May 1852. Before however exhibiting the subject matter of this final report, three matters require especial notice; viz.—1st, An attempt to improve the Indian Churka; 2nd, An attempt to simplify the American saw gin; and 3rd, The further progress made in the cultivation of American Cotton. 243

Para. 240.

1st, Mather's improved Churka.—This machine was constructed in Bengal, and obtained a prize, but was never fairly tried in the Madras Presidency, nor indeed does it seem to have been regarded as generally satisfactory. It differed from the ordinary Madras Churka, described in para 25, in the following particulars. The upper roller was of steel instead of wood. The motion of one was communicated to the other by means of a spur wheel and pinion instead of an endless screw, by means of which the upper roller performed four revolutions to one of the lower roller. 244

Parl. Report (1857) Bengal p. 367, 414, and 439.

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A fan of strong whalebone brushes was also attached, for cleaning the staple as soon as it has passed through the rollers; much in the same manner as the brush-wheel attached to the American gin cleaned the staple after it was separated from the seed by the circular saws. Opinions were expressed both by Dr. Wight and Mr. Finnie on the description of the machine which was forwarded to the Madras Government; and accordingly, it was requested that two Mathers's improved Churkas might be sent to Dr. Wight's experimental Farm. No further report upon their working capacity is to be found in the Madras records. From the reports published in the Cotton Blue book for Bengal, the improved Churka appears to have failed to meet the expectations which had been formed of either its cheapness or its efficiency; whilst its cost was sixty rupees, or double the cost of the Cottage gin described in the next para.

Mr. Finnie's letter, 30th March 1848. Dr. Wight's letter, 4th April 1848. Sir Henry Montogomery's letter, 17th April 1848. Parl. Return (1857) p. 390,391.

245 **2nd, The Manchester Cottage saw Gin.**—The Cottage gin was an attempt to simplify the American gin, and so far to cheapen it, as to bring it within the means of the Indian Ryot. Its principle was the same as that of the American gin, and an illustration is appended which will perhaps prove sufficient to explain its working. Instead of sixty or even twenty saw wheels, there are but four, and each saw wheel is only ten inches in diameter. The length of the Cottage saw gin is only two feet; and its height is only twenty inches at the hopper, and sixteen inches over the brushes. The weight of the whole is only seventy five pounds. The saws and brushes are put in motion by wheels and bands turned by two winches, one on each side, which may be moved by two children. The working of the machine is the same in principle as that of the larger gins. The seed Cotton is thrown into the hopper, and carried away by the circular saws; and as the seed is too large to pass through the narrow grating, the staple alone is carried

Royle's Cotton culture, p.540.

COTTAGE SAW GIN.

Fig 1.

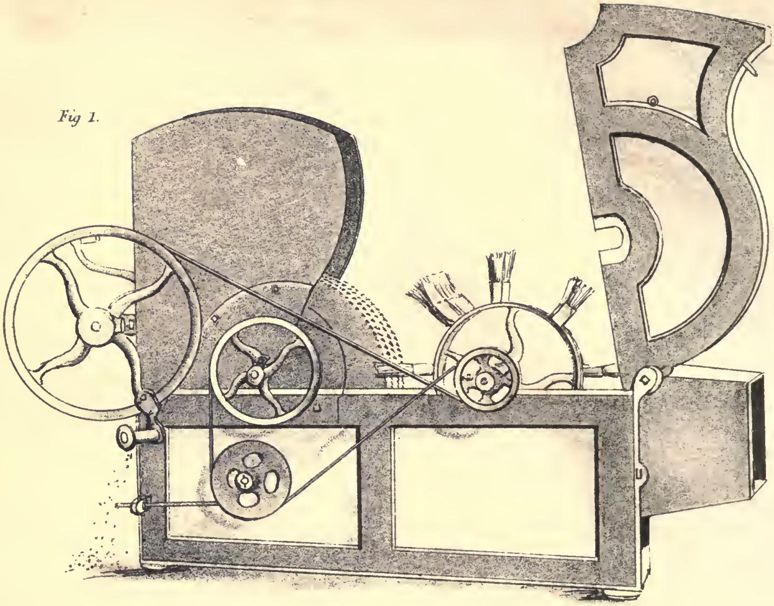


Fig. 4.

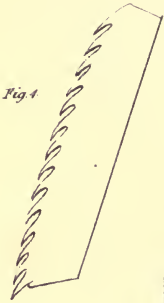


Fig. 3

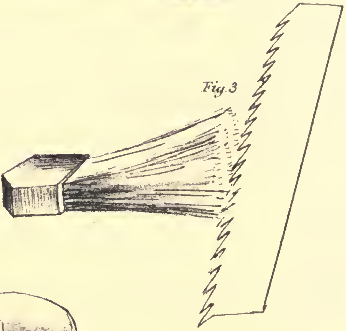
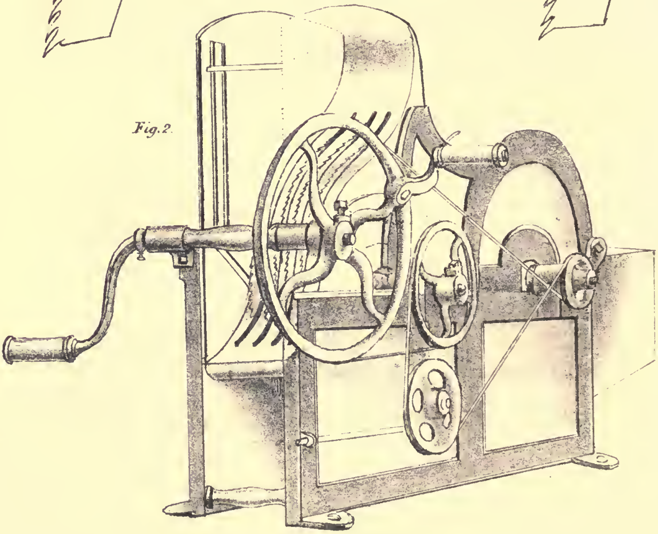


Fig. 2.



LITH: PRESS D.P.W. CHEPAUK.

away, and the seeds fall down. Thus the staple is separated from the seed at the moment the saws pass through the grating; and the staple is cleaned and brushed off from the saws by the brush wheel which revolves in an opposite direction.

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Twenty-four Cottage saw gins received by the Madras Government, 1849.—The Cottage saw gins described above, had been constructed under the direction of the Manchester Commercial Association, as being specially adapted for the use of the Indian Ryot. The cost, exclusive of all charges for freight or carriage, was about £3, or thirty rupees, each. Twenty four of these saw gins were dispatched to the Madras Presidency, in order that their efficiency might be practically tried. The results of their trial by the Madras Chamber of Commerce, and subsequently by Dr. Wight, may be thus exhibited. 246

Dispatch from the Court of Directors, 7th and 14th March 1849. Parl. Return (1857) p. 376.

Report of the Madras Chamber of Commerce: the working of the Cottage Saw gin unsatisfactory.—In November one of these Cottage saw gins was submitted to the Madras Chamber of Commerce, and was tried twice in the presence of the members. Mr. Nelson, the Chairman, reported that the members present regarded the result as unsatisfactory:—1st, Because the mode of operation might have been deranged by a wrong adjustment of the saws; and 2ndly, Because the gear might have been put in better working order by a person thoroughly acquainted with the machine. The results were thus summed up. The seed Cotton submitted to the action of the gin consisted of New Orleans, Bourbon, and Tinnevelly. With the New Orleans the gin did not effectually separate the wool from the seed; its action was frequently choked, and the small quantity delivered was considerably injured in the staple. With the Bourbon the effect was worse; the staple being very much cut up, and rendered 247

Mr. Nelson's letter, 9th Nov. 1849. Parl. Return (1857) p. 383.

CHAP. V. unfit for spinning. With the Tinnevelly the gin entirely failed to separate the staple from the seed; and such portions as came through were utterly useless for spinning purposes.

248 **Expense of the Cottage saw gin an insuperable bar to its employment in India.**—But even apart from these defects in the working of the Cottage saw gin, the Chamber was of opinion that its cost would prove an insuperable bar to its general use in the Cotton districts; and it was doubted whether a Native would voluntarily work a machine of such a description, even if its successful operation was rendered much more evident. The Chairman's report concluded with the significant notification that no member of the Chamber had expressed a wish to purchase any of the gins.

249 **Dr. Wight reports favorably of the Cottage saw gin.**—Four months after the foregoing trial, Dr. Wight sent to the Madras Government a highly favorable report of the working of the same gins. He requested that the whole of the Cottage saw gins then in Madras might be forwarded to his establishment at Coimbatore, with a view to their being cleaned and fitted for work. He said that those already received had been found to do their work exceedingly well; all except the bands, which were unequal to the strain they had to endure during the course of two or three days steady working. He therefore felt surprised at the very unfavorable report of the Madras Chamber.

Dr. Wight's letter, 20th March 1850. Parl. Return (1857) p. 384.

250 **Prices of the Cottage saw-gin to Natives and Europeans.**—A few days afterwards, Dr. Wight reported that he had received three applications for the purchase of Cottage saw gins, and requested to be informed at what prices he might supply them. The cost price in England was £3 each, and this was of course exclusive of freight and charges. The Madras Government however informed Dr. Wight, that he might dis-

Dr. Wight's letter, 25th March 1850. Government Order 22nd April 1850. Parl. Return (1857) p. 385.

pose of them at twenty-five Rupees, (£2 10*s.*) each, or at a lower rate still, if he thought it necessary to encourage purchasers. These orders however were only to apply to Native applicants ; Europeans were to be charged the prime cost in England, or 30 rupees per gin. CHAP. V.

Favorable report of the Collector of Tanjore : subsequently reversed.—About the same time, Mr. Bishop, Collector of Tanjore, who had also received two Cottage saw gins from Government, reported that they worked very well, and enquired whether he could be furnished with three or four more, at a moderate price, for sale in his District. Three months afterwards however, he countermanded the order, as the Cottage gins tore the Cotton too much to be of service. 251

MrBishop's letters, 26th March and 8th July 1850. Parl. Return (1857) p. 386.

Favorable reports on the Dharwar Saw-gin.—Meantime, a saw gin in use in Dharwar had attracted the attention of Mr. Pelly, the Collector of Bellary. Mr. Pelly had been informed that the Dharwar gin could be worked all day by two men alternately ; that it cleaned about 1½ maunds (42 lbs.) of seed Cotton per hour, thus doing about three times the work of the Manchester Cottage gin; and that it cost only 40 rupees. At the same time the Collector of Cuddapah expressed a strong opinion upon the importance of introducing a suitable gin. Accordingly, the Board of Revenue solicited sanction from the Madras Government for the purchase of fifty Dharwar gins; twenty-five for experimental use in Bellary, and twenty-five for Cuddapah ; at a cost of £4 each, or £200 for the fifty. By this time however, further supplies of the Manchester Cottage gin had been received from England, making a total of seventy-two gins. Under these circumstances the Madras Government was unprepared to expend £200 in Dharwar gins ; and directed that Dr. Wight should furnish the Collectors of Bellary and Cuddapah with as many Manchester Cottage gins as could be spared ; but in addition 252

Mr. Pelly's letter, 6th April 1850. Collector of Cuddapah's letter, 13th April 1850. Parl. Return (1857) p. 387.

Letter from the Revenue Board, 29th April 1850. Ibid p. 386.

Order of Government 3rd June 1850. Ibid p. 388.

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authorized each Collector to purchase for trial in his District five of the Dharwar gins.

Dr. Wight's letter, 4th July 1850. Parl. Return (1857) p. 389.

Mather's Machine Bengal P.R. p. 415. See also p. 463. for American 60 saw gins at Coimbatore.

253 **Dr. Wight compares the working of the Dharwar gin, the Manchester Cottage gin, and the large Hand-gin.**—The report of Mr. Pelly, that the Dharwar gin cleaned 42 lbs. of seed Cotton per hour, and that it could be worked the whole day long, naturally led to an application from Dr. Wight, that he also might be supplied with a model of this machine, for trial in his establishment at Coimbatore. The letter is somewhat confused, inasmuch as information as to the relative cost of labour on the churka and the various sorts of gins, is intermixed with arguments to prove that the reported success of the Dharwar gin was incredible. The latter question, considered apart, may be very briefly treated. The Manchester Cottage gins were each worked by only one man or one woman at a time. If worked by men, the average out-turn of each was from 70 to 75 lbs. of seed Cotton per diem; if worked by women, the average out-turn of each was only from 50 to 60 lbs. On the other hand, it was reported that the Dharwar gin, worked by two men alternately, could clean 42 lbs. per hour, or 220 lbs. in six hours. The reported superiority of the Dharwar gins was equally manifest when compared with the large Hand saw gins, which were built after American models. The Dharwar gins, worked by only two men alternately, could clean 220 lbs. of seed Cotton in six hours, and could be worked for a whole day, thus cleaning 440 lbs. in twelve hours. Whereas the large Hand gins, worked by eight men, four and four alternately relieving each other, could only clean about 500 lbs. in six hours, or about 83 lbs. per hour; and these eight coolies found the work so fatiguing that they could never continue it for more than six hours in one day. Accordingly, Dr. Wight applied for a model of the Dharwar gin; and the Madras Government

directed the Collector of Cuddapah to supply him with one; CHAP. V.
but no further information respecting the working of it appears upon the records.

254 **Relative cost of labour on the Churka, the Manchester Cottage Gin, and the large Hand gins.**—The coolies on the Manchester Cottage gins were paid at the rate of one anna (1½d.) for every maund of seed Cotton which they cleaned; but on the large Hand gins they were only paid eight pies (1d.) per maund. This enhanced rate had been found necessary in the first instance to induce the coolies to work the Cottage gin; but Dr. Wight considered that had the lower rate been always paid, their assiduity would have been greater, and consequently the out-turn would have been larger. Again, it is curious to notice that the coolies only cared to earn a certain amount per diem, and did not feel inclined to work more than was necessary to obtain that amount. Thus the women with the Churka could only earn each per diem from six to nine pies, that is from three farthings to a fraction more than a penny. The same women with the Manchester Cottage gin could each earn two annas, or three pence, per diem with ease; and they might, if they liked earn, as much as 4½d. per diem, but that they never seemed to care to do. It seems doubtful whether this reluctance to earn so much, arose from a corresponding reluctance to work, or from a fear lest the rate should be lowered if it was found that they could earn so large an amount per diem.

255 **Three years' progress in the Cotton experiment, 1850-52.**—During three years, that is from 1849 to 1852, the Cotton experiment seems to have proceeded without many references to Government. This is not surprising considering the circumstances. Dr. Wight was carrying on his duties in Coimbatore by the express orders of the Court of Directors, and in direct opposition to the opinions expressed

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by the Government of Sir Henry Pottinger. The gin-house at Coimbatore was sold to Mr. D. Campbell, a Madras Merchant, who unfortunately died a few months afterwards. Meantime Dr. Wight continued to distribute American seed, and to purchase the produce from the Ryots; and was also engaged in drawing up the final Report which had been ordered by the Court of Directors. The general progress of the experiment is thus set forth in this Report, which was addressed to the Madras Government in May 1852, and which will be found further on. During this period some other Cotton experiments were carried on in Coimbatore, Tanjore, and Tinnevelly, which are worthy of special notice.

Para 263.

256 **Colonel Lawford's cultivation by irrigation in Tanjore.**—Colonel Lawford's successful cultivation of American Cotton in Tanjore by means of irrigation has already been mentioned. No results however appear to have followed. In July 1849, Mr. Elton, the Collector of Tinnevelly, recommended that a fair trial of Colonel Lawford's plan should be tried in his district; as a comparison of the cost of culture by irrigation with the cost of culture on poonjah or dry lands, could alone prove whether the increase in the produce would be sufficient to cover the additional cost of production. But the Madras Government at that time was indisposed to engage in any further experiments, and passed a resolution that if irrigation was to be tried at all it must be tried by the Ryots alone. About the same time, the Collector of Tanjore was anxious to make a similar experiment on the annicut of the river Manney; and he suggested that he should be allowed to grant a tract of land, rent free for three years, to such Ryots as should be prepared to cultivate it with New Orleans Cotton. The suggestion of the Collector was strongly supported by the Board of Revenue, but the Madras Government considered that it was precluded by the orders of the Court of Directors from granting any such remission of the assessment. The

Para 111.

Mr. Elton's letter, 28th July 1849. Parl. Return (1857) p. 303.

Minutes of Consultation, 12th Sept. 1849. Parl. Return (1857) p. 305.

Mr. Bird's letter, 11th June 1849. Parl. Return (1857) p. 318.

Board of Revenue's letter, 9th August 1849. Parl. Return (1857) p. 317.

Minutes of Consultation, 28th Aug. 1849. Parl. Re-

Collector however was permitted to distribute American seed at the expense of Government, and to afford the use of implements to clean and prepare the Cotton for the English market, and to present small prizes for its successful cultivation. No results appear to have followed the experiment worthy of record.

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turn (1857) p 319. See Dispatch, 4th July 1848.

257 **Mr. Wroughton's Collectorate Farm at Coimbatore.** —About the same time, Mr. Wroughton, the Collector of Coimbatore, left the Presidency for Europe. Mr. Wroughton's successful cultivation of American Cotton has already been noticed. During four seasons prior to 1849, he had carried on the same experimental culture on a Farm of about sixty acres; and he was anxious that the experiment should be continued after his departure from the country. Sir Henry Pottinger did not consider that Mr. Wroughton, any more than Dr. Wight, had established any satisfactory result, beyond the bare fact that American Cotton of a superior quality would grow in Coimbatore, and that if favoured by seasons it would produce very fine crops. The Madras Government however authorized the continuance of the experiment under a Duffadar, who had been previously engaged under Mr. Wroughton, and who was now to be placed under Mr. Thomas, the new Collector. No actual results appear to have followed the continuance of the experiment; but some remarks by Mr. Thomas, in reference to the obstacles in the way of inducing the Ryots to cultivate American Cotton, are worthy of notice and may be exhibited here.

Para 66.

Memorandum of Sir Henry Montgomery, 10th April 1849. Parl. Return (1857) p. 306.

Memorandum, of Sir Henry Pottinger, 14th April 1849. Parl. Return (1857) p. 308.

258 **Mr. Thomas's opinions upon the best method of inducing the Ryots to cultivate American Cotton.**— Mr. Thomas recommended the continuance of the Collectorate Farm, because the cultivation of American Cotton would never be undertaken by the Ryots, without much encouragement, and long and satisfactory evidence of its feasibility. He believed that their re-

Mr. Thomas's letter, 13th May 1850. Parl. Return (1857) p. 311.

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luctance arose from these causes. First, the national apathy and dislike to enter on any new and untried method or speculation. Secondly, the fact that the New Orleans Cotton required a somewhat better soil and moister atmosphere than the Native Cotton. Thirdly, there was a pressing want of a home market and demand for the American Cotton. This last obstacle was the most important of all. The Native Cultivator had neither the means nor the enterprise to grow for a distant or foreign market. The Native merchant would readily buy the shorter but stronger fibre of the Indian Cotton, because it was considered more suitable for the Native looms and manufactures; but the American Cotton he would not buy. It therefore remained for private European mercantile agency to create a certain and ready market in the Cotton districts, by buying the Ryot's Cotton every year at a fair rate for cash. Such a local agency would command a large supply of New Orleans Cotton, or of any other commodity which the soil and climate of the district were capable of producing. In addition to the creation of local markets, the object in view would be greatly facilitated by advances to the Ryots, personal intercourse, punctual payments, and other similar arrangements, private and mercantile, which would be practicable through an European Agency. Government also might aid the effort by a very slight and temporary reduction of the assessment on all lands under foreign Cotton; but still Mr. Thomas believed that a sure and permanent market on the spot would be a sufficient encouragement; and that if the crops of Native Cotton could pay the land tax, the crops of American Cotton would be able to dc the same.

Correspondence and other pa-

259 **Cotton cultivation by Mr. David Lees in Tinnevelly: discussion concerning the right of Chayroot Renters.**—The experiments of Mr. David Lees in the cultivation of American Cotton in Tinnevelly, and their failure on the

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score of cost of cultivation, will be found noticed in Dr. Wight's final report, but a few additional particulars will find a fitting place here. Mr. David Lees had originally proceeded to Southern India, under the sanction of the Manchester Commercial Association, to make experiments and ascertain facts in connection with the cultivation of American Cotton. The success of those experiments subsequently induced him to establish his nephew Mr. Arthur Lees in Tinnevelly, as a Cotton planter and merchant; in order that he might continue and extend the cultivation, and at the same time purchase all the American Cotton that the Ryots were disposed to cultivate upon his own improved system. An obstacle however arose to his own cultivation from the claims of the Chayroot Renters. These men paid a considerable sum to Government for the right to dig up all the Chayroot* produced in the Tinnevelly district, whether on waste land, or on land occupied with dry cultivation. This right had been farmed out from time immemorial; and accordingly in December 1850, nearly a whole year after the commencement of the Cotton culture, the Chayroot renters claimed the privilege of entering the fields under culture by Mr. Lees, and of their digging up the Chayroots with a kind of spear about a foot and a half long. Mr. Lees of course resisted this claim, especially as the digging for the roots was injurious to the cultivation of American Cotton. The Chayroot renters then demanded compensation. The matter was brought to the notice of the Court of Directors by the Manchester Commercial Association; and the Directors instructed the Madras Government to relieve Mr. Lees from any demand in excess of the regular assessment; and on the renewal of the Chayroot farms to restrict the renters to the uncultivated lands. The Madras Government however had already anticipated those orders, by cancelling the existing

pers, Parl. Return (1857) p. 319, 332.

* A root from which a certain dye is extracted.

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Chayroot Farm, and by restricting the terms of future Farms in such a way as to debar the renters from all lands under cultivation. The matter led to some further correspondence as to the propriety of levying an assessment on the lands producing Cotton, equal to what was levied on lands producing Chayroot. As however it subsequently appeared that Mr. Lees's experiment had proved a failure, the quantity obtained being insufficient to pay the cost of culture, no alteration was made in the ass essment, and things remained as they were.

260 **Discussion respecting the purchase of American Cotton on Government account from the Ryots of Tinnevelly.**—In April 1852 a correspondence arose respecting the purchase of American Cotton from the Ryots in Tinnevelly. It seems that Mr. Bird, the Collector of Tinnevelly, had applied to Dr. Wight for some fifty or seventy bags of New Orleans Cotton seed, to be distributed amongst the Ryots ot the district. At the same time Mr. Bird had represented that if the Government would permit him to purchase the produce of the seed on their account at the rate of nine annas a toolam (2⅓ maunds) on the spot,—being the rate which had been previously paid by Mr. David Lees,—he was satisfied that the Ryots would accept the seed and cultivate it freely; and he added that unless a certain market were placed before the Ryots of Tinnevelly, they would never undertake the cultivation of the New Orleans plant. Dr. Wight forwarded Mr. Bird's letter to Government, and recommended that the authority requested should be granted. He also suggested that, in such case, the Government decision should be forwarded to the Manchester Association; as he believed that the Association would then be induced to establish Agencies themselves for the purchase and growth of exotic Cotton at several stations along the coast, and thus give an impetus to the cultivation, which no amount of Government patronage could supply.

Mr. Bird's letter, 20th April 1852. Parl. Return (1857) p. 233.

Dr. Wight's letter, 29th April 1852. Parl. Return (1857) p. 233.

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Authority for the purchases refused by the Madras Government.—It is scarcely necessary to add that the authority for the purchases was refused by Sir Henry Pottinger's Government. It was decided that the instructions of the Court of Directors did not authorise the Government to sanction any such engagement; that it was the duty of the Manchester manufacturers to send their own agents to the Cotton growing districts, to make their own bargains with the cultivators. If the rate proposed was a fair one, it ought to be offered by the merchants; but as it was, the proposition seemed to be in reality a suggestion that the Government should purchase Cotton at any price, and then sell it to the manufacturers of Manchester at such a rate as was best suited to their trading purposes. 261

Minutes of Sir Henry Pottinger, 17th May 1852. Order of Government, 1st June 1852. Parl. Return (1857) p. 233,234.

Completion of Dr. Wight's Report, May, 1852.— 262
About this time Dr. Wight appears to have completed the final report which he had been called upon to draw up by the Court of Directors. The Report is a long one, but the following summary contains the whole of the facts and opinions set forth in the original document. This was deemed peculiarly necessary here; for though much that is stated has already appeared in former paragraphs, it will be convenient for the reader to have the whole of Dr. Wight's matured results at one view. It will be remarked that nothing is said of the results of the season of 1849-50 when the irrigation experiment was tried; and indeed there is reason to believe that the experiment proved a failure in Coimbatore.

Dr. Wight's Report, dated 12th May 1852. Parl. Return (1857) p. 235.

DR. WIGHT'S FINAL REPORT, 12TH MAY 1852.

Stage of the Cotton experiment in 1849.—The 263
following report has been delayed in order to enable me to exhibit the very important changes, which have taken place during the last three years, and which are going on, I trust,

CHAP. V. with still greater rapidity. Previous to 1849,* notwithstanding the inducements held out of high prices and certain markets, the Ryots of Coimbatore would only cultivate American Cotton to a very limited extent; and then they proceeded in such an unwilling and unsatisfactory manner as almost to ensure a failure. At the same time, the reports, which reached me from other parts of the country, were generally unfavorable; and almost led to the belief that the soil and climate of India were actually unfitted for the growth of American Cotton, and that my own convictions to the contrary were based upon error; though in reality they rested upon the fact that we usually produced good average crops, and often very heavy ones, under circumstances which were by no means peculiarly favorable.

264 **Improved prospects during 1850-51 and 1851-52.**—Within the last ten years a series of changes have taken place, not perhaps sufficiently advanced to admit of certain conclusions, but still holding out a most encouraging prospect. Within that brief period, many of the Ryots of Coimbatore appear to have become so convinced of the great advantages to be derived from cultivating American instead of Native Cotton, that last season they planted between 1500 and 2000 acres of ground with it, and seem as if they intended to treble the quantity during the present year. At the same time I have had numerous requisitions from various quarters for supplies of seed; and in answer to my Circular addressed to the Collectors, all except one have requested more or less of the new seed just arrived from home for their respective districts. Lastly, within about the same period, a novel extension has been given to the experiment, which promises to yield most important results. I allude to those trials which are now in progress

* The year Mr. Finnie, the American Planter, left India.

on the sea coast. These trials have been conducted under considerable disadvantages, originating from want of agricultural experience; but still their past success almost leads one to anticipate, that the Sandy soils of the coast will hold the same relation to the American Cotton, as the Black soils of the interior hold to the Native plant.

Previous reluctance of the Ryots to cultivate American Cotton connected with the existence of the Cotton Farms.—I cannot account for the previous unwillingness of the Natives of Coimbatore to cultivate American Cotton. It must however have been connected with the existence of our Farms; for, whilst they were in full operation, nothing would induce the Ryots to cultivate the American plant beyond a very limited extent; whereas now that they have been discontinued the cultivation is rapidly extending. 265

Ryots encouraged by their own success to extend the cultivation.—The gradual extension of the culture of American Cotton by the Ryots, is also to be ascribed to the success of their own experiments. When the Farms were given up in the season 1849-50, the growing crops on them were made over to the Ryots. Those who tended them with care obtained unexpectedly large returns; and even those who took no trouble, obtained much more than they expected, and much more than they would have done, had the land been cultivated, however carefully, with Native Cotton. These successes seem to have satisfied all who were interested in the matter, that there was but little difference between the modes of cultivating American and Indian Cotton, whilst larger returns could be obtained from the former than from the latter. The experience of the current season 1851-52, has greatly strengthened these impressions. Two fields of Red soil side by side were both cultivated by Natives, one with Native and the other with American 266

CHAP. V. Cotton; and the Native Cotton only produced about 27 lbs. per acre, whilst the American Cotton produced 57 lbs. Again, two fields of about 22 acres, one Black and the other Red were sown; the Black soil with Native Cotton, and the Red soil with American Cotton. The Black field produced 500 lbs. of Native Cotton, whilst the Red field produced 1,250 lbs. of American Cotton. Both were sown at the same time in November; and both enjoyed the same climate and culture. During this same season, the two monsoons were each below the average; yet the crops of American Cotton have been generally heavy, and those of the Indigenous Cotton generally light. This result has particularly pleased the Native growers. The fact is, that the Native Cotton was sown during the North-east monsoon, which proved a failure; whilst the greater part of the American Cotton was sown during the South west monsoon in July and August, and being well advanced before the scanty North-east rains set in, derived great benefit from them. Indeed, when so managed, the danger to the American Cotton lies in the excess, rather than in the deficiency of the North-east rains. Thus during unfavorable seasons, the chances are in favour of American Cotton over Native; and it may be presumed that the chances will also be greater in favorable seasons; and that consequently the Ryots will continue the cultivation of the exotic plant.

267 **Large results in 1850-51, and 1851-52.**—In 1850-51 I had more applications for American seed than in any previous year; probably in consequence of the successful crops obtained by the Ryots from the relinquished Farms. The season was not a favorable one, yet I was enabled to purchase fifty-one bales of Native grown American Cotton. This success gave such an additional impetus to the change of feeling already in progress, that the applications for seed in 1851-

52 were on a still more extended scale; and I have already dispatched ninety bales of Native grown American Cotton to England, and expect before the end of the season to obtain a great many more. CHAP. V.

Ryots adopt Dr. Wight's practice.—Hitherto the 268
Ryots have adopted one system of culture. 1st, Selecting light sandy soils through which both the roots and moisture can easily penetrate. 2nd, Sowing in rows instead of broad cast. 3rd, Ploughing and otherwise cultivating the land between the rows. The Natives have already discovered and appreciated one great advantage in this last measure, namely, the facility it affords for fallowing, whilst the crop is still on the ground, by repeated ploughings between the rows as a preparation for the next rotation. Fallowing is much in vogue amongst the Natives, apparently because it furnishes a cheap substitute for manuring.

Refutation of the theory that the climate and soil 269
of India are unfitted for American Cotton.—The view, that the climate and soil of India are so far inimical to the constitution and habit of the American plant as to render its naturalization impossible, is based on imperfect observation and on a comparison of dissimilar things.

1st. The theory is founded on the assumption that 270
Indian Cotton has succeeded when the American has failed.—The opponents of the cultivation of American Cotton in India assume that the Indian plant is less precarious than the American plant, and that the Indian has generally succeeded when the American has failed. This assumption however is not only incorrect, but the real case is exactly the reverse; for whenever we had bad crops of American Cotton, the crops of Native Cotton were much worse. I am satisfied that, if during the last ten years equal areas had been annually appropriated to each, the out-turn from the

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American would in most cases have exceeded that from the Indian both in weight and value.

271 **2nd. The theory is based upon a comparison of crops grown in India, and of crops grown on the Mississippi, instead of those grown in Georgia.**—Again, many have compared the crops of American Cotton grown in India with the crops grown in America, without sufficiently adverting to the difference in the circumstances under which they have been respectively produced. Neither the soil nor the climate of India are inimical to the American plant. This is proved. For eleven years the American plant has been cultivated in India in all kinds of soil, such as rich and poor, wet and dry; and in all kinds of climate, such as temperate and hot, humid and dry; yet, whilst the weight of the crops has greatly varied, the quality of both of the Cotton and the seed has remained comparatively unaltered. The error has arisen from a comparison of crops raised in India, with the crops raised in the most fertile districts of America, which lie along the banks of the Mississippi.

272 **Differences between India and the Mississippi do not prove that the soil of India is inimical to American Cotton.**—The fertility of a soil depends on causes which are liable to vary. It often differs widely in adjoining fields, it is in a perpetual state of change, and it is more or less modified by every crop grown. In the deep alluvial deposits along the banks of the Mississippi, the material, on which the Cotton plant feeds, is found in such abundance, that several successive crops are taken off, without any alternation, and without any other manure than what is supplied from the ashes of the old plant which is burnt upon the ground. In the soils of India, this material which supports the Cotton plant was perhaps never so abundantly supplied as on the Mississippi; and is

now so greatly exhausted from long use, that the land produces about one fourth less, and rarely yields two successive crops from the same field. This deficiency is not to be attributed to any thing inimical in the soil of India, but simply to its impoverishment. This is proved by the fact that heavy crops have been obtained in India from land newly broken up. Generally however, a crop amounting to between 400 and 500 lbs. of seed Cotton per acre, equal to about 144 lbs. of clean Cotton, may be regarded as a heavy crop; and this will give a very handsome profit to the grower, being nearly double that which is usually obtained from the Native plant, even when grown in the best and most fertile Black soils.

Soil of Southern India better compared with that of Georgia.—If we really wish to compare the crops of India 273
with those of America, we ought to take the Georgian districts, where the Upland Georgian Cotton is grown. There from 400 to 500 lbs. of Cotton per acre is considered a very good crop, and thus the Georgian districts are on a par with the medium soils of India; yet no one alleges that the soils of Georgia are unsuitable to the growth of American Cotton.

Climate of Southern India not so congenial as that of Georgia: evil obviated by sowing in August or September.—The climate of Southern India however is 274
not so congenial as that of Georgia. The seasons in the former country are drier, and the crops suffer more from drought. This however does not arise so much from any insufficiency in the quantity of rain, but from the rain falling within too short a period. Occasionally there is scarcely a shower for months, until the monsoon regularly sets in; and then, instead of the total fall of rain being distributed over two or three months, nearly the whole of it will fall within two or three weeks, or even within two or three days. In the light Sandy soils, which are the best adapted for the American plant, the effect of

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this new distribution of the rain is unfavorable. This evil however can be obviated. There is generally sufficient rain in August and September for sowing the seed; and when the plant is once fairly above ground it can stand a protracted drought. Consequently there would rarely be any loss of crop during the brief interval between August and September, and the setting in of the North-east rains; and after the rains, such an event would be a still rarer occurrence, as the plant grows rapidly during the rains and strikes deep root, thus securing for itself a steady supply of moisture long after the surface has become dry.

275 **Leading principles of Cotton culture in the Carnatic: sowing before the North-east monsoon, and selection of soil.**—This principle of sowing during the chance rains, which fall in August and September in anticipation of the North-east monsoon, ought to be kept steadily in view. By so doing, I believe that American Cotton might be successfully grown in any part of the Carnatic. I also believe, that if due care be bestowed on the selection of soil, the losses from failure will be rarer in the future cultivation of American Cotton, than they are at present in the cultivation of the Indigenous plant. In Coimbatore, the American Cotton sown during the autumnal showers of August and September has yielded very fair returns; whilst the Native Cotton, which was not sown until the commencement of the North east monsoon in October or November, has very generally failed. The North-east rains only lasted a week; and consequently were sufficient to bring the more advanced American plants into bearing, but were insufficient for the Indian plants which were only just sown. In a word, I have no hesitation in stating it as my conviction, that the American Cotton may and will become as thoroughly naturalized in Southern India as the Native species; and that on the average it will be quite as productive on the Black soils, and infinitely more on the light Sandy loams.

Objection of Native spinners to the soft silky fibre of the New Orleans Cotton.—One objection stands in the way of our expectation, that the cultivation of New Orleans Cotton will supersede the cultivation of Indian Cotton. The fibre of the New Orleans is soft and silky; that of the Indian is hard and rigid. The Native spinners have been so long accustomed to work the latter, that they find it difficult to work the soft and silky fibre of the New Orleans Cotton. But this objection is giving way in some districts; practice overcoming the difficulty. When I first came to Coimbatore, the Bourbon Cotton, which is still softer than the New Orleans Cotton, was not used by the Native spinners; but now they use it to a very great extent. In like manner the New Orleans will come into Native use, when it is more largely produced, and when its price has found a just level and acquired a market standard. 276

Difficulty of separating the seed, and prejudice against the seed as food for cattle.—The only remaining impediments to be removed are :—1st, The difficulty of separating the seed; and 2ndly, The prejudice against the seed as food for cattle. It is far more difficult to separate the wool from the New Orleans, than it is to separate the wool from the Bourbon seed. At present the growers of New Orleans Cotton are compelled to sell their whole crop of Cotton with the seed in it, instead of selling the clean Cotton wool only. This trebles the cost of carriage, and prevents the grower from retaining any portion for domestic consumption. The other impediment is the prejudice which exists against the use of the New Orleans seed for feeding cattle. It is considered to be insalubrious. This prejudice however has already been overcome to a very great extent. 277

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278 **Nothing wanted to secure a rapid extension of the American Cotton culture, but a steady market and moderate competition.**—All that is wanted to secure a rapid extension of the cultivation of the American plant, is a steady market ; and such a moderate competition amongst the merchants as will convince the growers of the reality of the demand. Were such competition established, I fully believe that twenty thousand acres would be cropped with American Cotton within three years ; and that the cultivation would rapidly extend from Coimbatore to the neighbouring districts. The cultivation is just as simple, and just as well understood, as that of the Native plant, and the cost is not greater ; whilst the crops are in the main just as certain, and the produce far greater and more valuable. Such being the advantages which the American Cotton possesses in the inland districts over the Native staple, it would soon obtain the same general favour among the agricultural community of Coimbatore, as it has already acquired in Dharwar, if exporters would only stimulate its production by giving it the preference over the Oopum or Native Cotton.

279 **Cotton cultivation on the Coromandel coast: New Orleans, Sea Island, Egyptian, and Brazilian.**—Having thus described the present condition and future prospects of the experiment for denaturalizing the American Cotton in the inland districts of Southern India, it now only remains for me to indicate what has been doing on the Coromandel coast. Here I apprehend will be found a favorable field for the cultivation of several of the most useful varieties of foreign Cotton ; particularly the Mexican or New Orleans, the Sea Island, the Egyptian, and the Brazilian or Pernambuco. The three last are long stapled Cottons, and fetch high prices in the English market. My remarks however will be less explicit, as I have seen but little of the coast experiment, which is still in its infancy, and which

has laboured under considerable disadvantage, from being conducted by gentlemen but little conversant with agricultural affairs. CHAP. V.

280 **Partial success of Mr. David Lees on the sandy coast lands of Tinnevelly: error as regards deep sowing.**—The cultivation of American Cotton by Mr. David Lees, on the sandy coast lands of Tinnevelly, has proved only partially successful; for whilst Mr. Lees was a warm and sanguine advocate of the experiment, he was unfortunately an unskilful agriculturist. He desired to modify the cultivation by deep sowing; and feeling dissatisfied at the results of sowing the seed three inches under the surface, he gave directions for sowing it still deeper. This modification was founded on an erroneous deduction, and its practice has already been found to do harm. Cotton ought not to be sown deeper than one or two inches. What is required is a light loose soil, into which its slender tap root can easily penetrate; and when that is secured, the nearer the seed lies to the surface the better. Nature sows entirely on the surface, and ordains that the root shall descend and the stem ascend. Loose soil and light covering promote both these ends, and are more likely to increase than to diminish the produce; and indeed, unless the former of these conditions be secured, and maintained by occasional hoeing and ploughing between the rows, the plant does not thrive. The roots, in short, of a healthy growing plant require the free access of the air, almost as much as the leaves require light; and unless they have it, the plant becomes more or less sickly.

281 **Sandy soils along the Coromandel Coast adapted to the cultivation of American Cotton.**—But whilst the success of Mr. Lees, experiment fell far short of his anticipations, it has established beyond all doubt that the sandy

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soils along the Coromandel Coast, aided by the humid atmosphere, are very suitable to the cultivation of American Cotton; a fact which is daily becoming more firmly established by the success attending the well conducted efforts of Messrs. Longshaws at Trichindore in Tinnevelly, and of Mr. Kenrick at Madras. In addition to a light assessment, these lands possess a further advantage, which is important in a tropical climate, of being easily cultivated in all seasons, whether wet or dry. Consequently the cost of cultivation is materially lessened. Moreover, there is moisture for the most part near the surface, and generally within reach of the roots of the plant, which have a tendency to penetrate to a great depth in search of it. I expect therefore, that the crops will prove much more uniform, inasmuch as they will be less liable to injury from occasional protracted droughts. Giving due weight to these favourable circumstances, I anticipate that crops averaging from 200 to 250 or even 300 lbs. per acre, will generally be realised; at which rates, if the Ryots can only be induced to engage heartily in the cultivation of these foreign Cottons, the shores of the Carnatic will alone, in the course of a few years, be able to produce many thousands of bales; and, having the advantage of cheap transit to the port of export, at prices which will at all times enable the Indian to compete with the American grower.

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282 **Sir Henry Pottinger's Governmet condemns Dr. Wight's Report.**—The foregoing Report of Dr. Wight did not meet with the approval of the Madras Government. In fact Sir Henry Pottinger wrote a Minute violently condemning it. Considering that it was the result of experiments extending over eleven years, he pronounced it to be a meagre and unsatisfactory document, in which the statements and opinions were alike unsupported by facts.

Sir Henry Pottinger's Minute, 12th May 1852. Parl. Return (1857) p. 212.

283 **Recommends, that as the Farms had proved injurious, and that as the Agency was no longer necessary,—all Government intervention should be withdrawn.**—Sir Henry Pottinger drew special attention to two admissions made by Dr. Wight:—1st, That so long as the Government Farms were in full operation, no amount of inducement that he could hold out seemed to have any effect in stimulating the Ryots to engage in the cultivation of American Cotton, beyond a very limited extent; 2nd, That nothing more was wanted to secure the rapid extension of the American plant but a steady market, and moderate competition among merchants, to convince Indian growers that the Cotton was really in demand. The Madras Government inferred from the first admission, that the further existence of Government Agency was injurious; and from the second admission that it was unnecessary. Accordingly the Governor in Council recommended that Government should abstain from all further intervention in the matter.

Para 218. Minutes of Consultation, 6th July 1852. Parl. Return (1859) p. 243.

284 **Dr. Wight's protest against the conclusions of the Madras Government.**—Dr. Wight protested against the inferences which the Madras Government had drawn from his two admissions on the following grounds.

Dr. Wight's letter to Government, 10th Aug. 1852. Parl. Return (1859) p. 243.

285 **1st, The Government Farms had not proved injurious, but the groundless suspicions of the Ryots.**—The true reason why the Ryots had refused to cultivate American Cotton, was not because they were alarmed at the expenditure, but because they believed that it was incurred with the view of raising the rent of the land, so soon as it was ascertained that they could successfully cultivate the New Cotton. This belief was not stated in so many words as here set down; but it was expressed in terms sufficiently clear not to be misunderstood. The Ryots certainly never had any ground for distrusting the honour and uprightness of our intentions;

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but still the correctness of the interpretation of their language, was confirmed by the fact of their systematically holding back, until they saw what they considered to be good reason for believing their suspicions to be groundless and unjust.

286 **2nd, The Government Agency had not proved unnecessary, as it removed the suspicions of the Ryots.**—Though Dr. Wight had stated, that nothing further was wanted but remunerative prices on the spot, it was not to be inferred that the continuance of Government Agency, after the withdrawal from the Cotton Farms, had proved wholly unnecessary. It was the temporary continuance of the Agency, which had removed the suspicions of the Ryots, and led to the increase of the cultivation. Had not Dr. Wight been on the spot, the cultivation of New Orleans Cotton in Coimbatore would have nearly ceased with the crop of 1849; whereas by his purchases of produce at liberal prices, and by his reiterated assurances of the good faith of Government, the cultivation had so extended, that during the current season he had already distributed 400 maunds of seed. Moreover, Dr. Wight represented that, had he not continued his purchases of American Cotton from the Ryots, he would have acted prematurely, and would moreover have created doubts of our probity. Seven or eight years previously, Government had agreed to purchase from the Ryots all well cleaned picked Cotton. Circumstances had compelled Dr. Wight to continue his purchases. The old contract, made some seven or eight years previously, by which Government had agreed to purchase from the Ryots all first sort of American Cotton at 20 rupees per candy, had never been cancelled. The gin house at Coimbatore had been purchased by Mr. Campbell, the merchant; and Mr. Campbell had agreed to retain the same terms. But meantime Mr. Campbell had died, and

prices had so fallen at home, that had he lived he would have been a loser. The only other merchant in the place, being bound by no contract, would only give from 16 to 17 rupees per candy. Under such circumstances, the Ryots represented to Dr. Wight that he was bound to purchase the American Cotton at the prices fixed in the still uncancelled contract; and that unless he did so, they would grow no more American Cotton. Dr. Wight saw both the justice and the expediency of their claim; but whilst fulfilling his duty as Government Agent, he took the opportunity of cancelling the long standing agreement, and of assuring the Ryots, that if they continued the cultivation of American Cotton after the current year, they must run the chance of the market, exactly as they were in the habit of doing in the case of the Native article.

Retirement of Dr. Wight: Final Despatch of 287
the Court of Directors 1853.—Dr. Wight appears to have retired from the service, and to have left India in March 1853. In the following July, a despatch from the Court of Directors was addressed to the Madras Government, ordering that all purchases of American Cotton to cease from that date, and that all direct interference in the culture of foreign Cotton should be gradually withdrawn.

The following is a literal copy of the despatch of the Court of Directors:—

"REVENUE DEPARTMENT,
20th July 1853.

"OUR GOVERNOR IN COUNCIL AT FORT ST. GEORGE.

" 1. We entirely approve your having declined to entertain the proposal of Dr. Wight, that all the Cotton grown by the Ryots in Tinnevelly from American seed, should be purchased at a fixed rate by the Government. There are now, it appears, individuals connected with Manchester settled in the District; and if the price at which the Ryots can afford to sell the Cot-

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ton is greater than it suits the purpose of those parties to give, it is hopeless to attempt to force the cultivation by factitious encouragement on the part of Government.

" 2. The statement of Dr. Wight, that since the relinquishment of the Government Farms in Coimbatore, the Ryots have taken to the culture of American Cotton on their own account, to an extent considerably greater than during their existence, would seem to imply that the time had arrived when the interference of Government could properly be withdrawn. All that is now wanted, you observe, is a purchaser on the spot ready to give a fair remunerating price to the Ryot for his Cotton, and in your opinion, this object can only be attained by affording full scope to private enterprise, and by abstaining from all intervention on the part of Government.

" 3. In our despatch of the 4th July 1848, we directed that the purchases of American Cotton on the part of Government, should not, at that time, be discontinued; observing, however, "We are satisfied that no satisfactory and permanent extension of the cultivation of the American Cotton will be attained, until the persons most interested in its production shall take the matter into their own hands, by locating in the Districts competent Agents, empowered to purchase from the cultivators such Cotton as may be produced of a description suited to the wants of the manufacturers in this country.

" 4. We are of opinion that a sufficient period has elapsed since the date of these instructions, for the course of proceeding indicated in them to be adopted; and that, if the inducements to engage in the purchase of Indian grown American Cotton for use in this country are still insufficient, a further perseverance in our efforts to force the cultivation, by means apart from the ordinary operations of commerce, can lead to no beneficial result. We accordingly think that we may properly withdraw from the market as purchasers of American Cotton; and we hereby convey to you our authority for gradually relinquishing all direct interference in the culture of Cotton of that description, in the hope that it has now reached a point where it may be safely left to private enterprise.

We are, &c,

R. ELLICE,

J. OLIPHANT."

CHAPTER VI.

PRESENT CONDITION OF THE COTTON CULTURE IN THE SEVERAL DISTRICTS OF THE MADRAS PRESIDENCY, 1853—62.

(288.) Stage of the Cotton Experiment, 1853-62. (289.) Survey of the present Cotton cultivation in the Madras Presidency.

(290.) First, NORTHERN CIRCARS: four Districts. (291.) 1. *Ganjam*: produce inconsiderable but easily increased by money advances. (292.) 2. *Vizagapatam*: Cotton grown insufficient for home consumption and not remunerative. (293.) 3. *Godavari*: Cotton supply larger but insufficient for the wants of the District. (294.) 4. *Kristna*: large Cotton supply.

(295.) Second, EASTERN PLAIN OF THE CARNATIC: eight Districts. (296.) 1. *Nellore* : a grazing District. (297.) 2. *Madras*: Native Cotton not grown. (298.) Experiments in Foreign Cotton: Mr. Shubrick's successful cultivation of the Egyptian variety. (299.) Experimental culture of the Brazil or Pernambuco variety by Dr. Mudge. (300.) 3. *North Arcot*: Red soil, and consequently no Indian Cotton. (301.) 4. *South Arcot*: inconsiderable quantity of Indian Cotton. (302.) 5. *Trichinopoly*: quantity of Cotton inconsiderable: mode of cultivation. (303.) 6. *Tanjore*: Soil not favourable without irrigation, and with irrigation the cultivation of rice is preferred. (304.) 7. *Madura*: detailed report from the Collector. (305) Soil. (306.) Geology and topography. (307.) Climate. (308.) Seed used and whence obtained. (309.) Character of the Cotton Plant. (310.) Mode of cultivation, time of flowering, weight of Cotton wool per acre. (311.) Manure. (312.) Diseases. (313.) 8. *Tinnevelly*: Mr. Mayne's detailed report. (314.) Soil. (315.) 1st. The Caresal, or Black soil. (316.) 2nd, The Veppel, or Black and Sandy soil. (317.) 3rd, The Pottel, or stiff clayey soil. (318.) 4th, The Shevel, or Red Soil. (319.) Geology and topography. (320.) Climate. (321.) Seed used and whence obtained. (322.) Character of the Cotton Plant. (323.) Mode of cultivation, time of flowering, weight of Cotton wool per acre, etc. (324.) Manure. (325.) Diseases. (326.) Mr. Silver's report. (327.) Queries of Sir William Denison, with Mr. Silver's replies. (328.) Letter from Mr. Hardy, European Agent at Tuticorin.

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(329.) Third, CENTRAL TABLE-LAND : five districts. (330.) 1. *Bellary*, detailed reportfrom the Collector. (331.) Soil. (332.)Geology and topography. (333.) Climate. (334.) Seed used and whence obtained. (335.) Nature and Character of the Cotton plant. (336.) Method of cultivation, time of flowering, and weight of Cotton wool per acre, etc. (337.) Manure. (338.) Diseases. (339.) 2. *Kurnool*: a Cotton growing district. (340.) Cost of transit: the sole obstacle to increased production. (341.) Improvements in the quality must be effected by the Merchants themselves. (342.) 3. *Cuddapah* : present state of Cotton as reported by Mr. Wedderburn, the Collector. (343.) Detailed report by Mr. Murray, the previous Collector. (344.) Soil. (345.) Weeds. (346.) Geology and topography. (347.) Climate. (348.) Seed used and whence obtained. (349.) Character of the Cotton Plant. (350. Mode of cultivation, time of flowering, weight of Cotton wool per acre, etc. (351.) Manure. (352.) Diseases. (353.) 4. *Salem* : Messrs. Fischer and Co., the only exporters. (354.) 5. *Coimbatore* : detailed report of Mr. Thomas, the Collector. (355.) Soil : Black, Red and Alluvium. (356.) Geology and topography. (357.) Climate. (358.) Seed used and whence obtained. (359.) Character of the Cotton plant. (360.) Mode of cultivation, time of flowering, weight of Cotton wool per acre, etc. (361.) Manure. (362.) Diseases.

(363.) Fourth, WESTERN STRIP, OR MALABAR COAST : three districts. (364.) 1. *North Canara* : not a Cotton producing District. (365.) Report of the District Engineer on the experimental culture of Mr. Kleinknecht, (366.) 2. *South Canara* : not a Cotton producing District. (367.) 3. *Malabar* : not a Cotton producing District. (368.) Native States : Mysore, Cochin, and Travancore.

(369.) Conclusion : general results. (370.) Four general conclusions. (371.) 1st, American Cotton can be grown, but the profit is questionable. (372.) 2nd, Indian Cotton may be improved, but only to a degree. (373.) 3rd, American Cotton must always command a higher price than Indian. (374.) 4th, The demand for Indian Cotton must always depend upon the supply of American. (375.) Political and Commercial prospects of Indian Cotton.

CHAPTER VI.

PRESENT CONDITION OF THE COTTON CULTURE IN THE SEVERAL DISTRICTS OF THE MADRAS PRESIDENCY, 1853—62.

Stage of the Cotton Experiment, 1853-62.—The efforts on the part of the Madras Government to introduce American Cotton and American machinery into the Madras Presidency, virtually closed with the departure of Dr. Wight from India in 1853. Since that period, some experiments in the growth of American Cotton have been carried out by private individuals, and may be said to have confirmed the general results worked out by Dr. Wight; namely, that under the conditions set forth in the preceding pages the foreign plant may be successfully cultivated, and a staple produced far superior to that appertaining to the Indian plant. But the question of whether this better stapled Cotton can be grown with profit to the cultivator, seems as far from solution as ever. Before however offering any comment upon these results, it is advisable to take a general survey of the present condition of the Cotton cultivation in the several Districts of the Madras Presidency. 288

Survey of the present Cotton cultivation in the Madras Presidency.—In carrying out the review thus indicated, it will be advisable to proceed with each District separately, according to the geographical distribution of the several Collectorates already set forth at para 9, viz :—1st, Northern Circars; 2nd, Eastern Plain; 3rd, Central Table Land; and 4th, Western Strip. The materials for this survey have been selected from a mass of official reports and other documents, which it is not thought expedient to print in extenso. 289

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290 **1st, Northern Circars: four Districts.**—The Northern Circars consist of a long narrow arm of territory stretching from the Pagoda of Juggernaut on the frontiers of the Bengal Presidency, southward along the Bay of Bengal to the river Kristna. It comprises four Districts: viz.—(1) Gangam, (2) Vizagapatam, (3) Godavari, (4) Kristna.

291 **(1) Ganjam: produce inconsiderable but easily increased by money advances.**—In this District the Cotton cultivation of late years seems to vary from four thousand to six thousand acres. As the quantity of Cotton grown is so insignificant, the Collector merely makes a few general observations. He says that there is one material fact which has not been made sufficiently clear to the mercantile community at home; namely, that the Native agriculturist will undertake nothing new on the mere assurance that it is in demand in a distant market. Cases where the security of profit would appear most perfect to the European mind, would have no effect upon the Native. But on the other hand, there is no tropical produce which the European with capital might not command, by bringing his capital into immediate contact with the producer. If suitable money advances were made on the spot, Egyptian Cotton and other fine varieties could be grown in Ganjam within an easy distance of the coast.

Appendix I.

MrForbes's letter, 20th April 1861.

292 **(2) Vizagapatam: Cotton grown insufficient for home consumption and not remunerative.**—In this district the average produce of Indigenous Cotton is about the same as in Ganjam. During the three years preceding 1861-62, the average extent of lands under Cotton cultivation was 5753 acres, which produced an average of about 250 lbs. per acre. This quantity is not sufficient for local consumption. Much cleaned Cotton is imported from Rajahmundry (Kristna); and much English Cotton yarn and twist are imported almost every month from Calcutta

Mr. Fane's letter, 22d July 1861.

and Madras. The Collector also remarks that the production might be increased by three measures. 1st, By offering rent free all the waste and jungle lands in the Government Talook of Negapatam (nearly 6000 acres) on the condition that nothing but Cotton was grown. 2nd, By sanctioning two good bullock roads, connecting Jeypore and Raipore with the coast. 3rd, By putting a stop to the exorbitant tolls demanded from the traders by the Zemindars between the Cotton growing districts of Nagpore and the coast. The Revenue Board did not consider that any real benefit would ensue from the false stimulus of granting lands rent free; but recommended the other measures to the consideration of Government. In a subsequent communication, the Collector remarked, that the chief cause why the Ryots of Vizagapatam did not grow Cotton more largely was because it did not pay. Eight months were required to produce a Cotton crop, whilst two crops of Gingely, and other dry grains, might be produced from the same lands within the same time, and secure a larger profit to the grower.

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Mr. Fane's letter, 15th Feb. 1862.

(3) Godavari: Cotton supply larger but insufficient for the wants of the District.—This District (Rajahmundry and Masulipatam) produces a larger quantity of Cotton than Vizagapatam or Ganjam, the extent of land so cultivated reaching 12,000 acres. The quantity raised however is still insufficient for the home consumption, and further supplies are imported from the Kristna District. The means of communication between the uplands on which the Cotton is grown, and the ports of shipment, are all easy. 293

MrPurvis's letter, 28th November 1861.

(4) Kristna: large Cotton supply.—Guntoor, which now forms part of this District, is regarded as a Cotton growing country. Upwards of 100,000 acres are under Cotton cultivation, and as we have seen, a considerable quantity is exported to the Godavari District. Every exertion is being made by the Department of Public Works, to effect a junction 294

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Mr. Thornhill's letter, 28th Nov. 1861.

between two canals,—that from Bezwarah, and that from Dowlashwarum to Ellore,—which will render the line of inland water commucation complete from the Cotton producing localities to the coast. The following particulars are supplied by Mr. Thornhill, the Collector. "The Cotton produced in this district is partly consumed within its limits, but by far the greater portion is transported by land to the northern districts of Godavari and Vizagapatam, where it is used by the native weavers. Very little however is exported by sea, and none is shipped direct for Europe. The Cotton is picked in the dry season, and is seldom cleaned and packed before the setting in of the monsoon in June; and therefore it cannot be moved until the following December or January, as the roads are not passable until that time. The soil suited to the cultivation is very widely spread, and therefore it cannot be doubted that the extent of land under cultivation would be largely increased, in the case of a larger demand, accompanied by a rise in price. At present the greater part of the Cotton grown is of the sort called "Red Cotton," which I am given to understand, is not now in demand for the European market. I do not however think that any measure of Government would have any effect in increasing the produce. There is abundance of room for an extension of the cultivation, and the merchants have only to send their Agents into the country, to enter into agreement with the cultivators, and to show them that the cultivation will be profitable, to induce them to bring more land under Cotton culture. In the same manner it rests with the merchants to point out the kind of Cotton that is required, and to make arrangements for the more speedy and effectual cleaning and packing of the crop.

295 **2nd, Eastern plain of the Carnatic: eight Districts.** —This territory, lying between the Eastern Ghauts and the Bay of Bengal, extends from the Northern Circars to Cape

Comorin, and is generally known by the name of the Carnatic. It comprises eight Districts: viz.—(1) Nellore, (2) Madras, (3) North Arcot, (4) South Arcot, (5) Trichinopoly, (6) Tanjore, (7) Madura, (8) Tinnevelly. CHAP. VI.

(1) Nellore: a grazing District.—This District produces about the same quantity of Cotton as Godavari, and but little more than suffices for its own wants. It is in fact a grazing District, and agricultural operations of all kinds are carried on very negligently; the people being more addicted to rearing cattle than to cultivating the land. 296

Mr. Smith's letter, 10th May 1848. Parl. Return (1857) p. 39.

(2) Madras: Native Cotton not grown.—In this District, with the exception of some four acres, no Indigenous Cotton is grown by the Ryots, though some experiments have been made by private individuals in the cultivation of foreign varieties. As regards the Native Cotton, it has been grown only by one Ryot; and Mr. Charles Reade, whilst Acting Collector, drew up a few questions, in order to ascertain from the solitary cultivator, what his views and feelings were, particularly in reference to the extension of the cultivation. From the Ryot's replies it would seem that he had emigrated from the north of India, where it was customary to cultivate Cotton. Accordingly he brought some seeds with him, and planted them in his village in the Madras District; but he intended the produce, not for sale, but for home consumption; spinning the Cotton into thread, and employing weavers to make it into cloths for his own use. The attempt however proved unsuccessful, as the soil was not congenial to the plant; and on this account he was not willing to extend the cultivation. 297

Mr. Reade's letter, 14th January 1862.

Experiments in Foreign Cotton: Mr. Shubrick's successful cultivation of the Egyptian variety.—But whilst the soil of the Madras (Chingleput) District was not adapted to the growth of Indian Cotton, it has been found 298

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very favorable to the American varieties. Garden experiments in general are not very reliable, inasmuch as the plant receives far more care and attention under such circumstances than it can possibly receive from the Ryot. Mr. Shubrick, the Collector, has been highly successful in raising Egyptian Cotton, which received the approbation and thanks of the Board of Revenue and Madras Chamber of Commerce. Unfortunately, Mr. Shubrick returned to Europe whilst the experiment was still under trial, and his Cotton plantation seems to have been neglected and consequently failed. Seed however was forwarded to the Collectors of Cuddapah, Bellary, Kurnool, Coimbatore, and Tinnevelly, for the purpose of carrying on the experiment in their respective Districts. The trial proved a failure. It seems probable however, that the experiment might have stood a better chance of success had it been tried in the maritime Districts, and on soil more nearly approaching to that of Madras. It has already been seen that Black soil is well adapted to the growth of Indian Cotton, but not to the growth of American ; but even in Tinnevelly, the seeds obtained from Mr. Shubrick were planted in Black land. On the other hand, the Collector of the maritime District of Ganjam has expressed an opinion, that Egyptian Cotton might be grown to a great extent in his Collectorate within an easy distance of the coast.

Proceeding's of Board of Revenue, 13th April 1860.

Mr. Hudleston's letter, 15th Oct. 1861.

299 **Experimental culture of the Brazil or Pernambuco variety by Dr. Mudge.**—An equally interesting experiment has been tried in Madras, with reference to the Brazil or Pernambuco Cotton, by Dr. Mudge, Surgeon Major in the Madras Army. The following concise account of this experiment, and of some others with Egyptian and Bourbon seed, has been kindly furnished by Dr. Mudge.

Letter from Dr. Mudge, 23rd Jan. 1862.

"I first tried the Brazil or Pernambuco Cotton in 1860. The Honorable D. Arbuthnot, Collector of Kurnool, gave me 12 seeds from which 11 plants came up. These were planted

out about the 25th March, in common garden soil with a small quantity of old manure; and were at first watered every day, or every other day, till they had attained about a foot in height. I then left Madras for the Neilgherries and did not return till the end of May. I found that the gardeners had neglected the trees, and that four out of the eleven were dead. The remaining seven prospered, and without any care, and with only an occasional watering, produced abundantly. In January and February they yielded more than two pounds of picked Cotton. This Cotton was valued by London Brokers at from 8½d. to 9¼d. per lb. A large quantity of seed was obtained, which was sown again in March and April—several hundred plants in the People's Park and about two hundred in my own garden, whilst a good deal of seed was also distributed to various parties. At this time (January 1862) the plants in my garden are in full bearing, and the crop promises well. The trees planted in the People's Park have failed, evidently owing to the very saline character of the soil. I hear that some planted in Coorg are thriving. It appears likely that this species will grow well in light Reddish soil, if allowed sufficient space, and will be found productive. Mr. Fischer of Salem informed me, that it did not answer there, probably owing to the greater dryness of the air and the different character of the soil.

"Egyptian and Bourbon seed were sown in the People's Park between the 1st and 4th April 1861, and were watered till the plants attained the height of one foot; after that they only got a little water occasionally. The earth round the roots was loosened once or twice. Both these species have borne very well. Cotton was first picked in August, and the plants have gone on bearing up to the present time. A large quantity of Cotton has been thus obtained from them.

"In preparing the soil a small country plough was used; the greater part of the weeds and coarse grass were picked

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out and removed, whilst the rest was turned into the furrows and left. The Cotton was sown in small circular holes.

"The exact quantity of Cotton obtained from these plants is not yet known, but it has been very considerable; and, so far as reliance can be placed on one experiment, seems to show that Bourbon and Egyptian staples will answer well at the Presidency.*"

300 **(3) North Arcot: Red soil, and consequently no Indian Cotton.**—This District, produces but a very inconsiderable amount of Indigenous Cotton; the average cultivation during the last five years being only fifty-seven acres. The absence of the Black clay, which Native producers consider to be the soil best adapted to the growth of Native Cotton, is the probable cause of the smallness of the cultivation. The Collector describes the soil of the District as being a Red gravel; and it may be added that this appears to be the very soil which experience proves to be the best adapted to the American varieties.

Mr. Robinson's letter, 17th Dec. 1861.

301 **(4) South Arcot: inconsiderable quantity of Indian Cotton.**—The Indigenous Cotton grown in this District is larger than in North Arcot, but is still inconsiderable. The cultivation is confined to two or three thousand acres. The Collector states that he has no observations to offer on the subject.

302 **(5) Trichinopoly: quantity of Cotton inconsiderable: mode of cultivation.**—In this District, about 6,000 acres of Black soil are sown every year with Indigenous Cotton. Most of the Cotton grown is consumed within the District, but a small quantity is exported in the shape of twist. The rates proposed by Mr. Newill in carrying out the new Revenue Set-

Mr. McDonnell's letters, 31st May 1861, and 15th Feb. 1862.

* The Bourbon seed was sent to me by the Reverend W. Taylor of Madras, and was raised in his garden.

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tlement, are expected to promote the extension of the cultivation, as they are considerably lower than the present rate of Assessment. "Cotton however," we are told, "requires more "care, labour, and consequently more expense, than almost "any other description of crop; and unless there is the in-"ducement of soon realizing a remunerative price, the Ryot "will choose any other kind of cultivation in preference." Mr. McDonnell also drew attention to a report on the Cotton cultivation in Trichinopoly, drawn up by Mr. Travers the Collector in 1812. The following extract, relative to the mode of cultivation, is worthy of record. "The ground "is first ploughed up. Afterwards, a herd of cattle, or a "flock of sheep, is kept on the land for two or three days "to manure it. The ground is then again ploughed three "times more; and the seed, which has been dipped in a pre-"paration made of buffaloes' dung, salt water, and ashes, is "then sown, and the ground again lightly turned up to "cover the seed. When the plant has reached the height "of one span, the earth is carefully and very lightly plough-"ed up between the plants, and the grass that has grown is "removed. After this, as occasion may require, the weeds "and grass are continued to be rooted up until the plants "have reached maturity, when the Cotton is plucked."

(6) Tanjore: Soil not favourable without irrigation, and with irrigation the cultivation of rice is preferred.—The quantity of Cotton grown in this District falls far short of even the requirements of local consumption, and accordingly large quantities are brought from the Southern Districts of Madura and Tinnevelly to meet the deficiency. Repeated attempts have been made to improve the quality of the Cotton grown, and to extend its cultivation, but they have hitherto proved unsuccessful; and the land under Cotton crop is at the present time less than six hundred acres, being less than one fourth 303

Mr. Cadell's letter, 5th Dec. 1861.

Mr. Cadell's letter, 31st Jan. 1862.

Paras 111, 256.

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of what it was ten years ago. Mr. Cadell, the Collector, ascribes these results to the unremunerative nature of the crop, the uncertainty of the produce, and the labour and expense of preparation arising from the absence of any cheap and efficient machinery. He is also inclined to think that the soil of the District is not very favorable to the plants, unless it can be irrigated; and when the means of artificial irrigation can be commanded, the landholders prefer the cultivation of rice to the exclusion of almost every other article.

304 **(7) Madura: detailed report from the Collector.**—Madura is a Cotton growing district, though not one of the four great Cotton districts of the Presidency. The average number of acres under this cultivation during the last three years is about 76,000 acres. The following information respecting the culture, was supplied three or four years back by Mr. Hathaway, the Collector of Madura, in answer to an application for certain data connected with the growth of the Indian plant, which had been forwarded to the late Court of Directors by Dr. Mallet, Professor of Chemistry in the University of Alabama U. S.

Mr. Hathaway's letter, 7th June 1858.

305 **Soil.**—" The soil in which the Cotton is raised is Black, and of a slimy nature, being very retentive of the moisture; and if the periodical rains commence in August and continue till January, this moisture will penetrate the earth to a depth of two feet and a half. By the commencement of January, the moisture is reduced to a depth of four inches, and disappears altogether by the 1st of March. In some parts the Ryots raise along with Cotton the following dry crops,—coriander, horse-gram, vărăgoo, cumboo, thenie, dholl, and cummin. These thrive if the periodical rains fall; but many of the Ryots consider such a practice of mixed sowing prejudicial; as Cotton itself cannot be grown two consecutive years in the same field.

Geology and topography.—"The district is not naturally well drained, depending as it does upon the freshes from the river and periodical rains, which are very uncertain in their supply. The soil is generally of an inferior description, being based in many places upon rocks of black and white marble and granite, and masses of gravel, which rise to within from one and a half to five yards of the surface. It is also impregnated with saltpetre. The height above the level of the sea of that portion of the district in which Cotton is raised, ranges from six to seven hundred feet. 306

Climate.—"The regular kălum rains commence in 307
August and terminate in November; while the kòday rain falls in March and April. The year 1858 however, proved an exception, as during the month of May there was an average fall of more than nine inches in fifteen days. The annexed statement shews the amount of rain that fell during the last official year.

	Mea.	In.	T.
Madacolum	71	1	4
Tiroomangalum	45	7	7
Meylore	65	1	8
Tandicomboo	66	0	1
Izempully	54	7	2
Tenkurray	18	7	5
Nellacottah	67	3	4

Seed used and whence obtained.—"After the fibre 308
has been removed, the seed is preserved, till within a few days of the sowing season. It is then soaked for two or three minutes in water in which cow-dung has been steeped, and then pressed by hands on a floor exposed to the sun, with a view to remove any particles of the fibre, and thus to ensure the separate deposition on the ground of each seed, which takes place three days afterwards. In some instances, under the impression that such a process will render the Cotton white and smooth, the Ryots mix with the said water,

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chunam, butter-milk or salt; but I have no information that any such result is obtained.

309 **Character of the Cotton Plant.**—"The Cotton of this district is herbaceous in character, growing to an average height of $3\frac{1}{8}$ feet. The branches extend about $1\frac{3}{8}$ feet from the stems, which grow at an average distance from each other of $1\frac{1}{8}$ feet. The main root shoots downwards to a depth of $1\frac{1}{16}$ feet; whilst the lateral roots spread out about $\frac{9}{16}$ of a foot.

310 **Mode of cultivation, time of flowering, weight of Cotton wool per acre.**—"The fields intended for this cultivation are usually ploughed seven times, at the least four times, between May and September. In the latter month, ten days previous to the sowing of the seed, the soil is manured, either through penning cattle on it, or by the imposition of manure, and then once more ploughed. The seed is scattered from the 20th October to the 10th December, the early period being the most advantageous, so as to let the seeds fall at an average distance from each other of $1\frac{1}{8}$ feet. Transplantation is not adopted. The plants require at the stages of their budding and flowering, harrowing and weeding; the cost of this is estimated at Rupees $3\frac{1}{2}$, or 7*s.* per acre. The buds generally form about the 15th January, and the picking of the crop takes place in March and April. For this operation the labourer receives remuneration in kind, at rates, which vary according to mutual agreement from one-fourth to one-tenth of the out-turn. The weight of Cotton wool produced per acre in this year 1857-58 (which from the drought has been an unfavourable one) is estimated at $23\frac{1}{2}$ lbs. Each hand employed is supposed to be able to give $4\frac{3}{4}$ lbs., a day; machines of an ordinary description being used for the purpose.

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Manure.—" Although Cotton seed may return to the ground, manure is still used, and the stalks are removed to serve as fuel. 311

Diseases.—" The plants are attacked by many diseases ; 312
the principal of which are called Sambal or Sooroothy knoo, and are supposed to be caused by the prevalence of North winds and lightnings. The former disease gives the Cotton a pale tinge, while the latter causes the leaves of the plant to curl. They are also attacked by caterpillars and worms, whose correct names I am unable to obtain."

(8) Tinnevelly : Mr. Mayne's detailed report.— 313
Tinnevelly is one of the four principal Cotton growing and exporting Districts in the Madras Presidency. The average Para 17.
cultivation of late years is about 190,000 acres. The principal port is Tuticorin. This District will be remembered as the scene of Mr. Finnie's experiments and labors. The following Mr. D. Mayne's letter, 8th Nov. 1858.
interesting report, with reference to Professor Mallet's application for information, was supplied by Mr. Dawson Mayne.

Soil.—" Cotton is cultivated in all descriptions of soils 314
found in this district, but more extensively in those known as the Cărēsal or Black Cotton soil ; secondly, in the Veppel (a mixture of Black and Sandy soil) ; thirdly, in the Pottel (a stiff clayey soil) ; and fourthly, in the Shevel or Red soil.

1st, The Caresal, or Black soil.—" The Black Cotton 315
soil is of a loose friable nature, varying in depth from two to five or six feet. Soon after a heavy fall of rain, the upper surface of the soil, to a depth of about nine inches, becomes dry ; but the lower portion, to a depth of four or five feet, will retain moisture for four or five weeks. The other crops grown on this soil are cumboo, cholum, (different sorts of maize) ; buller, Bengal gram, vārāgoo, red gram (species

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of vetch or pulse), raggy, thēny, cootheerivaly, chendrookoo oil, and castor oil seeds, etc. The soil is considered extremely fertile.

316 **2nd, The Veppel, or Black and Sandy soil.**—" The Veppel, or Black and Sandy soil, partakes of the same nature as Black Cotton soil, varying in depth from two to four and a half feet. After a heavy fall of rain, the upper surface of this soil, to a depth of about six inches, soon becomes dry ; but the lower stratum, to a depth of three or four feet, will retain moisture for three or four weeks. The other crops grown on this soil are cumboo, raggy, cholum, buller, red gram, theny, and castor oil seeds &c. This soil also is considered to be fertile, but in a less degree than that first named.

317 **3rd, The Pottel, or stiff clayey soil.**—" The Pottel soil is stiff and untractable. It varies in depth from one to three and a half feet. After a heavy fall of rain, the upper surface of this soil, to a depth of four inches, will soon become dry : but the lower stratum, to a depth of three feet, will retain moisture for about two, or two and a half weeks. The other crops grown on this soil are cumboo, horse-gram, sāmay, vārāgoo, thēny, and castor oil seeds, etc. This soil is not considered fertile.

318 **4th, The Shevel, or Red Soil.**—" The Shevel soil is of a loose friable nature, varying in depth from one to three feet. After a heavy fall of rain, the upper surface of soil, to a depth of one foot, soon becomes dry ; but the lower portion, to a depth of one and a half or two feet, will retain moisture for one and a half or two weeks. The other crops grown on this soil are red gram, vārāgoo, castor oil seeds, thēny, etc. This soil is not considered fertile.

319 **Geology and topography.**—" The Cotton fields towards the west in this district are slightly undulating, with general slope to the eastward ; while to the east, the country

lies almost flat, the plains sloping very gradually towards the sea. From observation taken with an Aneroid Barometer, it appears that the level of the former varies from 250 to 300 feet, and of the latter from 80 to 120 feet, above the sea. Below the above mentioned soil, gravel of different descriptions, and kunkur, or decomposed gneiss, are met with ; and in some spots occassional strata of crystaline limestone crop up through the gneiss. The granite formation is chiefly found in the northern portion of the district, and is met with at various depths below the kunkur and gneiss. That which is termed "decomposed gneiss" may perhaps be a species of disintegrated rocks of a comparatively late formation. The northern part of this district is intersected by numerous small streams, and the Cotton fields are consequently well drained.

Climate.—" During the dry months, or from January to 320
September, the heat is excessive. During the South-west monsoon, there are occasional showers in the north of the district, especially in the more western portion of the Cotton fields. The North-east monsoon continues from the middle of October to January ; and during its prevalence, rain falls generally over the whole district. Irrigation is not employed for the growth of Cotton in this district. A return, showing the fall of rain from January to December 1857, is given on the following page. Rain Gauges are kept at all the chief stations.

Rain Report of the Tinnevelly District from 1st January to 31st December 1857.

	Northern Section.		Southern Section.		Eastern Section.		Western Section.		Total.		Average.	
	Inches.	Tenths.	Inches.	Tenths.	Inches.	Tenths.	Inches.	Tenths.	Inches.	Tenths.	Inches.	Tenths.
January...	..	2·500	1	1·563	2	·188	2	·625	5	4·876	1	3·719
February..	..	·938	..	..	..	3·938	..	·688	..	5·564	..	1·391
March.....	..	5·688	..	1·250	..	6·063	..	7·000	2	·001	..	5·000
April......	5	4·875	4	2·563	5	·875	6	4·750	21	3·063	5	3·265¾
May.......	..	2·000	1	3·000	1	7·313	1	·125	4	2·438	1	·609½
June......	..	5·750	..	5·188	..	9·938	2	2·625	4	3·501	1	·875¼
July.......	..	·313	..	·188	..	1·750	..	9·563	1	1·814	..	2·953½
August....	..	·563	..	3·125	..	·250	...	3·750	..	7·688	..	1·922
September.	..	2·563	..	6·875	..	·688	..	..	1	·126	..	2·531½
October...	9	7·680	5	6·900	6	4·820	13	7·400	35	6·800	8	9·200
November.	1	9·520	4	1·800	2	9·420	3	7·660	12	8·400	3	2·100
December.	..	·130	..	..	..	·418	..	..	..	·548	..	·137
TOTAL..	19	2·520	18	2·452	20	5·661	31	4.186	89	4·819		

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Seed used and whence obtained.—"Cotton seeds are obtained from those places in the district, where the previous crops had yielded a full produce of good quality. The seeds are in the first instances exposed to the sun to dry. When sufficiently dried, it is the practice to put them into water mixed with buffalo's dung, and then they are again dried, and the seeds are now considered ready to be sown in the proper season. 321

Character of the Cotton plant.—"The Cotton plants in Tinnevelly are herbaceous ; tree Cotton is not grown here. The average height of the plant is 3¾ feet, and the spread of the branches is 1¼ feet. The average distance from plant to plant is about one foot. The average spread of roots is one foot in depth and six inches laterally. 322

Mode of Cultivation, time of flowering, weight of Cotton wool per acre, etc.—"Cotton fields are ploughed five times between the months of April and September. After a good shower of rain, the seeds are sown generally between the months of September and October. The distance at which the plants are placed apart is about one foot. The weeds are removed three times during the growth of the Cotton plant. The total amount of labour bestowed upon weeding may be valued at about Rupees 1½ (3s.) per acre. The plants flower in the month of December or January. Picking commences in February and ends with April. If after this any rain falls, a further picking takes place in June and July. The weight of Cotton fibre is to the product per acre about 86 lbs.; weight per hand employed is 6 lbs. 323

Manure.—"There is not any Cotton seed returned to the soil in the form of manure, nor are the stalks allowed to decay on the field. The land under Cotton cultivation is manured with cattle dung. 324

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325 **Diseases.**—"When the Cotton plants come to bearing, they are subject to two kinds of diseases; the first is called in Tamil "Sambulnoye", and the second "Canjoorumnoye." When the first mentioned disease prevails, the yield becomes very indifferent; and if the last named disease exists, the pods drop off entirely. Unseasonable rains in summer, and lightnings, are said to be injurious to the Cotton plants, by causing the boles to drop off. Before flowers and pods appear, the plants are subject to the ravages of insects."

326 **Mr. Silver's Report.**—In a letter dated 20th February 1862, Mr. Silver, the Collector of Tinnevelly, reported as follows. "The average quantity of uncleaned Cotton, grown in the district of Tinnevelly during the last three years, was 150,000 candies, of 500 lbs. each. At the close of the past year 1860-61, there were about 44,000 candies of cleaned Cotton in this district, which is selling at 102 Rs. (£10-4s) per candy. There are no obstacles to the spread of Cotton cultivation, but a stimulus seems to be required; and the cultivation would doubtless be extended by the following means. 1st, By the Mercantile Firms establishing Agencies for dealing direct with the cultivators in the interior, instead of conducting this part of their business, as they do at present, through Brokers at the port of embarkation. 2nd, By constructing better roads, which in my opinion would be the case, if the executive were again placed under the Revenue officers, the District Engineer inspecting and reporting on the nature of the work performed."

Mr. Silver's letter, 20th Feb. 1862.

327 **Queries of Sir William Denison, with Mr. Silver's replies.**—Mr. Silver also forwarded to the Madras Board of Revenue, a paper of answers which he had recently drawn up, in reply to certain queries furnished to him by His Excellency Sir William Denison, Governor of Madras, as regards the Cotton trade at the Port of Tuticorin. These queries, together with the replies, are appended in parallel columns.

Queries.	Replies.
1st. Distance from Tinnevelly to Tuticorin?	Thirty-four miles.
2nd. Character of the country between the two places?	Bare and open passing over black soils, rocky ground, and deep sand; there is a made road for only 8 miles out of Tinnevelly, and the river Tambrapoorney unbridged, intervenes.
3rd. Amount of existing traffic between the two places?	Tinnevelly is not a Cotton producing Taluk. Cotton is grown in the northern Taluks and north-eastern Taluks. General commodities pass between the two places.
4th. Cost of transport per ton and per bale of Cotton from one place to another.	Cost of transport per ton and for a bundle of Cotton depends entirely on the season of the year. If in rainy weather when the Ryots plough their fields transport becomes expensive, but on the average the transport of Cotton to Tuticorin from the Cotton producing Taluks costs 10 Rupees per ton of 20 per cwt. or about 9 As. a bundle of 120 lbs.
5th. Quantity of Cotton passing from Tinnevelly to Tuticorin?	Cotton is not sent from Tinnevelly to Tuticorin. But the average quantity taken into Tuticorin yearly from the Ottapidarum, Sattur, Shenkarninarcoil and Strivilliputtur Taluks, along the trunk Cotton road connecting the Cotton growing localities with Tuticorin, is 33,000 Candies of cleaned Cotton.
6th. Quality of Cotton, whether of Native growth or improved varieties?	Entirely of Native growth; no other description is exported from Tuticorin. The quality is known in Europe as Tinnevelly Cotton; it is clean in color but short in staple, and generally fetches the highest price of Indian Indigenous Cotton.

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7th. Weight of an average bale of Cotton ?	The average weight of a bundle that comes from the District to Tuticorin is 120 lbs. Cotton coming from the interior is packed in bundles never in bales.
8th. Amount produced per acre in your District. State amount in two forms, firstly, quantity of Cotton seed; secondly, quantity of Cotton clean ?	1stly. The highest quantity of seed produced per acre is $\frac{3}{4}$ Candy equal to 15 Madras Maunds, and the lowest $5\frac{1}{4}$ Maunds.
	2ndly. The highest quantity of cleaned Cotton per acre is $\frac{1}{4}$ Candy or 5 Madras Maunds, and the lowest $1\frac{3}{4}$ Maund.
9th. Whether the soil of your District is of the black adhesive kind known as Cotton soil ?	Cotton is cultivated in this District on four descriptions of soils, viz., first, Karisel, or black soil; second, Veppel, a mixture of black and sandy soil; third, Pottel or stiff clay soil; and fourth, Shevel or red soil, but more extensively on black Cotton soil.
10th. Send a small quantity (4 or 5 lbs.) to Madras for analysis as soon as possible ?	Five pounds of each of the first three descriptions of soils will be forwarded to the Chemical Examiner at Madras for analysis.
11th. Price of Cotton on board ship ?	The price of Cotton on board ship varies considerably according to the state of the market, but on the average has been 89 Rupees per Candy of 500 lbs. net weight during the last four years.
12th. Price given to cultivator ?	The price given to cultivator per Candy of uncleaned Cotton with seed, ranges from Rupees 14-12-3 to Rupees 20-15-0.
13th. Average number of acres cultivated with Cotton by one individual in your District ?	Seven acres.

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14th. Maximum number cultivated with Cotton by one individual.	Sixty acres.
15th. Quantity of Cotton exported from Tuticorin ?	Quantity exported from Tuticorin in Fasly 1270, from 1st July 1860 to 30th June 1861, was 30,667 Candies.
16th. Is any extention of cultivation of Cotton likely to take place in your District were a stimulus given to the growth of Cotton by a considerable rise in its price, or by any other means ?	If there was a considerable rise in the price of Cotton, the cultivation would doubtless be extended. I do not see a better stimulus than this.
17. Quantity of Cotton grown in your District ?	The average quantity grown yearly in the last three years was 1,50,000 Candies ; this is Cotton not cleaned.
18. What is the total number of acres available for Cotton cultivation in this District ?	2,07,850 acres.
19th. Do Capitalists make advances to Ryots engaged in Cotton cultivation ?	The Merchants and Agents make large advances to the Brokers, Dealers and Nattookottay Chetties equal to three-quarters of the value of Cotton contracted for, and the latter again make advances to the Ryots engaged in Cotton cultivation.
20th. What is done with the surplus Cotton seed ?	A portion of the surplus Cotton seed is used as food for cattle, some is exported to Colombo.

Letter from Mr. Hardy, European Agent at Tuticorin.—The following letter, received from Mr. Thomas Hardy, at Tuticorin, furnishes the following particulars respecting the Cotton trade of Tinnevelly. 328

Mr. Hardy's letter, 10th Nov. 1861.

" The average exports of Cotton for the last 10 years from this District have been about bales 55,000, but this year it may probably reach 90,000 : one season, during this decennial period it reached only bales 16,000 the crop being nearly a total failure. During the first half of these ten

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329 **3rd, Central Table-land: five Districts.**—This large territory between the Western and Eastern Ghauts slopes away from west to east, and from south to north; that is,

from the great western chain of mountains to what might be called the eastern hills; and from the southern territory of Mysore, which has a mean elevation of 3,000 feet, to the northern Districts of Bellary and Cuddapah, where the mean elevation is 1,600 feet. It embraces five Districts, viz.—(1) Bellary, (2) Kurnool, (3) Cuddapah, (4) Salem, (5) Coimbatore.

(1) Bellary: detailed report from the Collector.— 330

Mr. Hathaway's letter, 10th June 1861.

Bellary is one of the largest Cotton growing Districts in the Madras Presidency. The Collector reports that nearly 600,000 acres are available for the cultivation, and of these nearly half were planted with Cotton during the season of 1860-61. The land is tolerably accessible to the ordinary country carts at all times, save during the rainy weather. A sufficient quantity of Cotton is obtained for consumption within the District, and a large quantity is exported to Madras, Bangalore, Wallajapet, and Coomptah. These lines of communication, with the exception of the one to Coomptah, appear to be in good order." The following extracts from a detailed report furnished by Mr. Pelly, the Collector, in reply to Professor Mallet's application, are worthy of record.

Soil.—" Attempts have at different times been made to 331

Mr. Pelly's letter, 7th May 1858.

introduce the cultivation in this District of the American Cotton; but the experiments have generally failed. The Cotton grown throughout this District, viz.—" White Cotton," is of but one kind. This Cotton is grown in the Black or Regud lands, dependent entirely on the rain; it is not usual to water Cotton by artificial means. It is customary to cultivate Cotton in every third year, leaving the land in the two intermediate years for the growth of Cholum (dry grain) crops. Before the rainy season sets in, the land is prepared and kept ready for sowing, by ploughing it twice with the implement called " Chinna Goontaka," a large hoe drawn by four bullocks. The Regud, or Black lands, of this District

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generally retain their moisture at a depth of half a yard under the surface. When sufficient rain has fallen to soak the upper surface to a depth of half a yard, and so to connect it with the under moist soil, it is considered that the land has received a sufficient supply, and Cotton is accordingly sown in it. After the sowing, if rain falls at any time within a month, it is of much benefit to the crop; but the crop is not dependant on this second fall, if the ground has been previously fully moistened. Cotton is sown by itself or with corraloo: two rows of the latter grain are sown for every one row of Cotton. Cotton sown by itself, is sown generally about fifteen days later than the sowing of Cotton mixed with corraloo. The land is liable to be overgrown with grass if not kept down; but weeds do not abound generally.

332 **Geology and topography.**—"The dry lands of this District may be classed into three sorts:—1st. Black; 2nd. Mixture of Black and Red; 3rd. Red. The soil of the southern Talooks is generally of the two latter descriptions, and that of the western Talooks is of the first and second descriptions. The other Talooks are entirely Black land. Much of the irrigated land is Black, and a portion is mixed with sand, like the second description of dry land, or with salt land. The Black and Mixed soils are free from any rocks or stones, but the Red land is intermixed with stones and gravels. This Red land is not fertile soil. When it is cultivated continually for three years, it becomes unfit for cultivation, and must lie fallow for five or six years. White gravel is found at two yards below the ground in Black lands, and Red gravel is found at about half to one yard below the ground in the other two descriptions of soil. The distance to this District from the eastern coast is about 300 miles, and from the western coast 200 miles; and its situation is about 1,500 feet above the level of the sea and is naturally well drained.

Climate.—" In this Inland District the rain fall is very small, generally about 20 to 30 inches at most, and the climate is very dry. The seasons for rain are from May to 333
August, and secondly from September to the 15th November. The quantity of rain that fell during the last five years is shown in the foot note.* The Cotton lands are entirely dependent upon the fall of rain, as irrigation is not employed.

Seed used and whence obtained.—" The kind of seed 334
used, is that of the Cotton grown in this district.

Nature and character of the Cotton.—" The Cotton of 335
this District is of the herbaceous character, or small shrubs. The height of the plant varies from two and a half to one and a half feet. Its branches are spread over a foot, and the seed sown is two or three inches apart in the same row, but between each row a space of about one foot and a half is left. When Cotton and corraloo are sown together, one row of Cotton is planted for every two rows of corraloo, and a space of about two feet is left between each line. The corraloo is harvested earlier than the Cotton, which comes to maturity a month afterwards. In the best lands, the root spreads one to one and a half feet in depth; but in ordinary land not deeper than one foot or even less; laterally it does not spread more than from three to four inches.

Method of cultivation, time of flowering, and 336
weight of Cotton wool per acre, etc.—" As already stated, the Regud or Black land, previously made ready for cultivation, is, upon a seasonable fall of rain, sown through bamboo tubes

	* Early rains. Inches.	Later rains. Inches.
1852-53	7·5	21·3
1853-54	7·1	2·3
1854-55	5·1	10·9
1855-56	2·3	15·3
1856-57	14·	6·4

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with an implement called Gooroo (Drill plough), containing three teeth, and drawn by a pair of bullocks. But in sowing Cotton and corraloo together, the former is sown in the drill made by the middle tooth of the drill, and the corraloo on either side; making one row of Cotton for every two lines of corraloo. When Cotton is sown alone, the middle drill is left unfilled, and the two outer ones are alone sown. The usual time for the cultivation of Cotton with corraloo is about the month of September, and for Cotton alone about fifteen or twenty days afterwards. The plants are two or three inches apart in the same row; but the rows are, as before said, one and a half to two feet from each other. The amount of labour bestowed upon weeding during growing time is as follows. When the Cotton and corraloo crops are of one month's growth, two implements (Hoes) called "Yadagoontakah", drawn with a bullock and a driver each, are employed for weeding on two occasions, once in twelve days. After this has been done, another description of implement, called "Juntalagoontakah", three in number, with a pair of bullocks and three drivers, is employed on two occasions once in ten days. The extent of land which may be weeded from nine o'clock in the morning up to the evening, would not be more than four acres; and the amount of labour bestowed upon weeding four times the above quantity of land, may be estimated at Rupees $2\frac{1}{4}$ or 4s. 6d. But where Cotton alone is sown without corraloo, the weed is hoed after one month's growth of the crop, twice at twelve days' interval by the "Pillagoontaka", with a pair of bullocks and two drivers, at a cost of eight annas per day, or one rupee for the two occasions they are employed. The average extent of land weeded in a day is four acres. The flowering time is generally two months after sowing, and the crop comes to maturity three months after flowering or five months after sowing. The Cotton is picked on three occasions in the month. It is in the second time that the

largest quantity of Cotton is picked. On the whole, the average quantity of Cotton produced per acre may be estimated at 15 maunds (375 lbs.); and, deducting one-third or five maunds for the remuneration of persons employed in picking, the net quantity remaining for the cultivator would be 10 maunds, which will produce 2¼ maunds of Cotton wool. On an average, one man is required to clean one maund of Cotton in a day, at the rate of one anna per maund.

Manure.—"Manure is never used; the seed is not re- 337
turned to the ground until the land is sown again. After the picking is over, the stalks are cut down and gathered, and do not decay on the field.

Diseases.—"The Cotton crop is free from the ravages of 338
insects; but when the North-east wind blows, the plant is subject to blight of three kinds, called "Mujjega," "Mussy," and "Barigi." By the first kind, the leaves of the plant become white; by the second, the tender as well as other leaves turn black and wither away soon; and by the last, the leaves, &c., become spotted and destroyed. But if the South-east wind blows, and the sun is bright, it will recover."

(2.) Kurnool: a Cotton growing District.—Kurnool 339
is a Cotton growing District, having about 250,000 acres under cultivation. It carries on a small export trade through Cuddapah to Madras. Mr. Minchin, the Collector, is of opinion that the sole obstacle to the increased production of the article, consists in its great bulk as compared with its value:—the cost of transit to Madras, and consequent low price which the trader can afford to pay to the producer as compared with other staples of production.

Mr. Minchin's letter, 6th Feb. 1862.

Cost of transit: the sole obstacle to increased 340
production.—"The average cost of a bandy from the Cotton producing Talook of Pattikondu to Madras is Rupees 30, or 60s; and as one third of a ton is the greatest load that

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is ever placed on a cart or bandy at the most favourable season of the year, ninety Rupees, or £9 per ton of the price obtainable at Madras, has to be deducted for the cost of transit. The Cotton itself is of a most worthless description, and its intrinsic value is not therefore sufficient to enable it to bear a costly land carriage. I am not myself of opinion that the staple is likely to be improved in any way by Native Agriculturists. The modes of cultivation, picking, and preparation, are all too slovenly to permit any reasonable hope of material improvement being effected by untaught Native efforts, even should the Ryots be willing to make any efforts of the kind. There is no doubt however, that when the ordinary Cotton of this country reaches a price sufficient to pay the cost of the expensive land journey to the coast, it can be produced in this district to a large extent, and the limit to its cultivation is simply its proportionate remuneration to the producer, as compared with that of grains. It appears certain, therefore, that the completion of the canal to Madras, and the cheap means of communication that will then be offered, will enable traders to pay a much larger price for the ordinary Cotton of this District than they can now afford to do; and should the present demand for the article continue, its production in this part of the country will be increased.

341 **Improvements in the quality must be effected by the Merchants themselves.**—"Should the exigencies of the English market induce English capitalists to settle in the District, under their guidance some improvement would doubtless be effected in the picking and preparation of the article. I doubt, however, the practicability of any real improvement being made in the staple; and believe that if England looks to India for her Cotton supply, our manufacturers must learn to make use of the present inferior description, which alone the country appears capable of producing."

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(3) Cuddapah: present state of Cotton as reported by Mr. Wedderburn, the Collector.—Cuddapah is also a Cotton growing district, about 50,000 acres being under this cultivation. Mr. Wedderburn, the Collector, reports as follows. " The out-turn of this district last year was calculated at more than two millions of lbs., valued at 3½*d.* per lb. upon the spot, or about £30,000, the greater part of which is exported. This Cotton, though short in staple, is of a fair quality ; but it is liable to deterioration from careless picking and packing. It is not properly cleaned, and when gathered it is packed loosely in bags which do not exclude the dust. Were some mercantile firm to purchase direct from the grower, and to superintend or insist on greater care in the gathering, and to establish a screw press on the spot to screw the bales ready for shipment in this dry climate, instead of that process being performed in the damp air of the Sea coast, I believe that the value of this Cotton in the home market would be enhanced, and the cost of carriage reduced. Finer qualities than the Indigenous Cotton could only be produced by a local demand and good prices." In a subsequent letter Mr. Wedderburn stated that the extension of the cultivation depended upon the profit to be derived from the exportation of Cotton, as compared with the exportation of other grain products. That Government could do nothing that would prove of advantage, beyond adding a few bridges to a road, and thus facilitating the export, and cheapening the cost of transit. Above all, that the people would not be induced to grow any kind of Cotton but their own stunted Indigenous variety ; all previous experiments with foreign seed having proved failures, excepting perhaps in gardens and favoured localities ; whilst the commercial value of other crops grown on irrigated lands, rendered it impossible that Cotton should be grown at a profit on any but dry lands. Private individuals must take the risk and profit of introducing a better

Mr. Wedderburn's letter, 25th April 1861.

Mr. Wedderburn's letter, 22nd Oct. 1861.

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system of cultivation, if there be one; and of dealing directly for the raw produce, which is much deteriorated in picking, cleaning, packing, and transit.

Mr. Murray's letter, 1st July 1858.

343 **Detailed report by Mr. Murray, the previous Collector.**—The following report, drawn up in 1858 in reply to Professor Mallet's application, conveys still more particular information respecting the Cotton cultivation in the district of Cuddapah.

344 **Soil.**—" Cotton is chiefly grown in the Western portion of the Cuddapah district, in land commonly designated " Ragada" or Black Cotton soil, which is very tenacious of moisture and is almost impassable in the monsoon. During the dry weather, the whole surface of the ground is broken up by the deep fissures caused by the drought, but is filled up during the rains. The soil is very fertile, in almost every part of the district, though there are some exceptions; and upon it, various kinds of cereals, pulse, oil seeds and indigo are grown, which when sown on land which are properly taken care of and manured, produce large returns.

345 **Weeds.**—" Black Cotton land, if not annually ploughed but left waste for several years, very soon becomes clogged by an Indigenous plant called Nut grass, which penetrates into the ground from three fourths to one yard deep, and the herbage spreads along the surface of the field; and should a Ryot wish to cultivate this waste land, he will require to yoke six or eight pairs of large heavy bullocks to his plough to force it through the roots, which also require to be extirpated by manual labour with the aid of pick axes. There is also an Indigenous plant with a root something resembling a Potatoe, commonly called by the Natives " Kudunchy;" the root varies from the size of a small to a large Potatoe, is excessively bitter, and cannot be eaten, and from it springs a species of vine, which runs along the

ground and produces a yellow flower, and a fruit of the size of a small green chilly, which is gathered by the Natives and used as food. I have never seen this root in any other, except in the Black land. A species of wild Hyacinth is also very common; several other kinds of weeds common to other soils are also produced upon Black soil.

Geology and topography.—" The Black Cotton soil rests 346
chiefly upon sand, kunkur or lime. When excavations are made for the purpose of obtaining water, it is found to extend 20 or 30 feet; and when resting upon the lime, the water found is brackish and unfit for domestic purposes; when resting upon sand the water is generally sweet. The soil may be stated to range from two yards to 30 or 40 feet deep. The district of Cuddapah is very mountainous. The Black Cotton soil commences at a short distance from Cuddapah, and runs westward on the east side of the Nullamalah range on through the Bellary district. The plains are undulating and naturally well drained, the drainage empties itself into small rivers, which again discharge themselves chiefly into the Paupugny and the Pennar rivers. One of these small rivers called the Khoondoo, which is fed by the drainage from the Black lands is, in the hot weather, so brackish as to be unfit for household purposes or irrigation. And in some places the soil is so impregnated with salt that the latter can be obtained by gathering it off the surface of the land. This salt is required for agricultural stock, and cannot be dispensed with. In the river beds, a species of slate containing Pyrites of iron is procured, which is used both in building and flooring houses. The height above the level of the sea may be stated to range from 2,000 to 2,300 feet in this province.

Climate.—" The climate in the hot weather is very hot; 347
and the Black soil becoming thoroughly heated, retains it until it is cooled down by the rains. Slight showers may

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be generally expected in May, June and July, which enables the land to be ploughed, and in some places sown; but the chief rains fall in September and October, when Jonna and Cotton seeds are sown; the former is cut in February and the latter gathered in March and April. For the Indigenous Cotton, irrigation is never used. A moderately dry season is the most favourable for the plant. Supposing that the land is thoroughly saturated with rain at the time of sowing, and another heavy shower is received about six weeks or two months later, it is sufficient to bring the Cotton plant to maturity. Succeeding rains tend to the growth of the plant, but to the decrease of the produce. The Ryots inform me that if the plants were irrigated they would yield only one-fourth of the return produced in a dry season. The average quantity of rain in the provinces, where Black Cotton soil is chiefly to be found, may be set down at Inches 22·914583, the average of the last three years.

348 **Seed used and whence obtained.**—"The seed used for sowing is obtained from the neighbouring villages. The general use made of Cotton seeds by the Cultivators is to feed their cattle; for which purpose they are most excellent.

349 **Character of the Cotton plant.**—"The Cotton plant grown in this part of the country is herbaceous. The Cotton tree grows in the jungles, but the produce is of no use in manufactures, the staple being too short. American and other Cottons have been tried in this district, but have hitherto failed. The Cotton plant is very hardy, provided it does not receive too much rain at the time of sowing. It is a herbaceous plant, which rises to the height of about three feet and extends its branches about 18 inches. The seeds are sown about a foot apart from each other in regular rows, and not unfrequently, horse-gram is sown between the

plants. The root of the Cotton plant shoots down perpendicularly to the distance of eight inches, and the plant is dependent upon one tap root, from which others diverge. Should this be destroyed, the plant dies.

Mode of cultivation, time of flowering, weight of Cotton wool per acre, etc.—" The land having been previously prepared, the seeds are sown in drills in the month of September, about twelve inches from each other. The night prior to sowing, they are saturated in a solution of fresh cow-dung and water; they germinate on the fourth day. After attaining a height of eight or twelve inches, labourers are employed in clearing away the weeds, and often in sowing grain between the plants. After the lands have been thoroughly cleared, and when the hot weather is approaching, the plough is run through the drills, and the roots of the plant are banked up. The plant commences to flower about the fourth month, that is, about January and February, as the time of sowing may be ; and the produce is gathered in the months of March and April. There are four pickings ; the first and the fourth are the least ; and the second and third the most productive. The average produce per acre may be stated to be eight maunds or 200 lbs., and the ginned Cotton 50 lbs. 350

Manure.—" Manure is not in general used for growing Cotton. It is made use of when jonna is sown, which is much more remunerative ; and as jonna ought not to be grown two successive years on the same land, Cotton is substituted. The Cotton stalks are cut and used as fuel ; sometimes they are placed with earth over them, as a protection to walls [of houses] from the monsoon rains. 351

Diseases.—" Cotton plants when weakened by unseasonable rains, suffer from the effects of a mildew, which covers the green leaf with white spots, and then the plant being 352

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thus weakened is speedily attacked by insects, grasshoppers, etc., and destroyed. Another species of blight causes honey dew to exude from the plant, which greatly weakens it. In January, should there be cloudy weather and rain whilst the pods are forming, they are very liable to drop off and the produce to be injured.

353 **(4) Salem: Messrs. Fischer and Co., the only exporters.**—The Cotton lands under cultivation in this District are rather more than 15,000 acres. Messrs. Fischer and Co., are the only persons in the District, who buy Cotton for exportation, and the views of Mr. Fischer upon the subject have already been exhibited. The Collector adds that good roads intersect the District in all directions, and that the lands on which the Cotton is chiefly grown are for the most part within twenty-five or thirty miles of the South Western Railway.

Letter of Mr. Brett, 14th Dec. 1861.

Para. 38.

354 **(5) Coimbatore: detailed report of Mr. Thomas, the Collector.**—In this important District, the scene of of Dr. Wight's labours, upwards of 120,000 acres are under Cotton cultivation. The report of Mr. Thomas in reply to Professor Mallett's application, is rather lengthy, but exhibits so many plain and practical details, that it has been expedient to print it in extenso, merely omitting certain data which have already been exhibited so prominently in the summary of Dr. Wight's reports, as to require no repetition here.

Mr. Thomas's letter, 18th Dec. 1857.

355 **Soil: Black, Red, and Alluvium.**—" The soils on which Cotton is grown in this district are as follows. 1. Black Cotton soil (also called Regur) a formation said to be peculiar to India. Its component parts seem as yet doubtful. 2. Red soil, formed from disintegrated granite, with a large admixture of sand. 3. Alluvium of sand and loam, very light and mixed with much kunkur limestone. The stiffer clayey soils do not answer well, being liable to bake and

become very hard in dry weather. These two latter are not very deep, averaging about fourteen inches. The Black soil is the deepest, averaging three or four feet, not unfrequently reaching six feet in depth; it is also the dryest, and though very absorbent after rain at first, it does not keep the moisture long, and the rain does not penetrate it beyond a few inches. In some of the more sandy Black soils, it is said however to penetrate three feet. The Red soils on the other hand, retain the moisture longer, and it penetrates them deeper. Nearly every crop grown in India is raised on these soils, the various kinds of millets, *the castor oil plant, etc. On the Black soil, coriander and Bengal-gram (Cicer Arietinum. Lin.) are also largely sown; but it is chiefly devoted to the Oopum or Native Cotton; the New Orleans, and other exotic species not having been found so suitable for it. The soils are all fertile, but a field's producing good grain crops is not a criterion it will yield a good Cotton crop, which is also regarded as very exhausting to the soil. The Red and Alluvial seem to produce no weeds, but are covered with the general vegetation of the country. The Black soil is singularly destitute of weeds; thistles and the daturata (Stramonium) seem to attach themselves most to it, and it nourishes only thorny trees of the acacia tribe.

Geology and topography.—" The district is entirely 356
primitive granite rock, over which the soil is in general but thinly spread; the underlying rock frequently cropping out. Beds of kunkur or limestone generally occur beneath the Black soil. Its topographical character is that of a wide plain between two mountain ranges, averaging 70 miles across from north to south. The Western portion lies op-

* E. g. Cholum (Holchus Saccharatus. Lin.)
Cumboo (Holchus Spicatus. Lin.)
Raggy (Cynosurus Coracanus. Lin)
Sámy (Panicum Miliaceum. Lin.)
Tenay (Panicum Italicum. Lin.)
Gram (Glycine Tomentosa. Lin.)

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posite the Paulghaut Gap, a remarkable break of some 30 miles wide in the line of the Western Ghauts about 70 miles from the Sea, through which the moist South-west monsoon blows inland strongly and incessantly from June to September. It is in the tract under the influence of of this current that the New Orleans and exotic Cottons grow best. The general level above the Sea, may be estimated at 1000 feet, and the surface being every where gently undulating is well drained.

357 **Climate.**—" From June to September, during the prevalence of the South-west monsoon, the climate is cool and cloudy with continual light rains. In October and November heavy showers fall, the North-east monsoon then sets in, and there is a continuance of clear, bright weather with heavy night dews till February. Hot burning land winds then prevail till May, and all vegetation is scorched up, though the early showers are generally looked for in April and May; these rains however are by no means constant. From June to September the tract lying within and in front of the Paulghaut Gap receives continual rain, which seldom however extends to the lands beside or beyond the gap. In October and November the heaviest showers fall. The yearly average of rain at Coimbatore is 18 inches, and probably twice as much in its south-west portion. Irrigation is not employed in the cultivation of Cotton. It was tried experimentally with favourable results, but had to be used sparingly, and care taken that the surface of the ground did not cake. In a small field, which had been occasionally watered, the crop of New Orleans Cotton, amounted to 260 lbs. per acre, whilst in another neighbouring field unirrigated, the pickings scarcely reached 20 lbs. per acre. Difference of soil however, may have had some influence over this; and by some, irrigation is said not to answer, producing leaves but not Cotton.

Seed used and whence obtained.—The seed of the Native Oopum Cotton is kept by the Natives from the last crop, and sown in the following season. The seed is not 358
separated from the Cotton till the sowing time, or it looses its germinating power. The New Orleans, Bourbon, Mexican, etc. seed used in the late Experimental Farm, was obtained by Government from England, or brought out by the American Planters formerly engaged on the Farm here. New Orleans seed of the ninth generation in this country produced excellent crops; and the American plant has been cultivated in this district from the same stock of seed for eleven years, without apparent deterioration in the quality of either the Cotton or seed produced.*

Character of the Cotton plant.—"The Oopum is a 359
small plant, seldom exceeding five feet in height, generally less, and wears the appearance of a degenerated species. Its branches have not the same lateral spread as the exotic kinds. The Bourbon also averages from two to three feet in height, but the branches extend almost as far laterally. The plants are low, depressed, crooked, and as it were stunted. The New Orleans variety, if left untrimmed, shoots up to nearly six feet in height. In the field it averages about four feet; the branches are longer and thinner than the preceding species, with more of an upward, than a lateral direction. A bush four feet high and trimmed will measure nearly as much in spread. Two hundred pods have been counted on a single bush, the stem often equals a man's finger in thickness, and it is the only description cultivated here, that at all approaches a tree. From a foot to eighteen inches is left between the plants, but if the growth is vigorous not less than an average distance of eighteen inches should be allowed. In moderately fertile and high and dry lands, from two and a half to three feet between the rows is enough; but for

* This fact has been disputed. See General results at the conclusion of the present chapter, para 372.

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moist low lying rich soils five feet is not too much, as in such circumstances the bushes will still fill the ground, and unless they have plenty of room the crop blights. The roots of Native Cotton penetrate deeper than American, and the Bourbon plant goes even deeper than the Native ; hence the two latter bear heat and drought better than American. In the samples of American plants now forwarded, the roots owing to their age (5 years) are immensely developed, extending some of them to four feet in length and two feet in lateral spread : this no doubt much exceeds the average of ordinary plants, which are now unfortunately not obtainable. The roots of the Bourbon plant appear to average one foot and a half in depth and fifteen inches in spread, and those of the Native Oopum Cotton to be about the same in depth, which considering it is much the smallest of the three, argues a greater proportional depth. Its lateral roots however appear to be very insignificant.

360 **Mode of cultivation, time of flowering, weight of Cotton wool per acre, etc.**—" In the Southern provinces of India, the cultivation of Cotton has to be adapted to the peculiarities of the seasons. Drought is an obstacle, not so much from insufficiency in the quantity of rain, as from its all falling within too short a period. Occasionally for months scarcely a shower falls, until the monsoon regularly sets in; and then, in place of the total quantity being distributed over two or three months, nearly the whole falls in as many weeks or even days. This usually happens in October; and a few days of gloomy weather and heavy rain has been known to destroy a fine crop just bursting the pod. It becomes therefore an object so to regulate the sowing, that the flowering shall commence after the heavy rains have ceased, and the pods ripen during the bright clear weather that always follows; so that in short, the plants may receive wet weather while growing, and dry sunny weather while maturing. The mode of cultivation is simple.

The ground is well ploughed, the deeper the better; and as much as possible freed from weeds, and if uneven the inequalities reduced. It should then remain fallow some months, and kept in readiness to receive the seed at a day's notice, a single heavy shower will then fit it for the reception of the seed. Any such falling between the middle of August and beginning of October should be taken advantage of, to get the seed sown. If this is done, the plant will be sufficiently advanced to derive the fullest benefit from the monsoon rains, and should come into crop in the course of January, a bright and dry month; from which time in ordinary seasons it will yield a constant harvest for three or four months, and if refreshed by a shower or two in April or May, will yield a second crop in Autumn. The first hoeing is a most important operation, and should never be delayed beyond the appearance of the third proper leaf (not counting the two seed leaves); the ground should be freely loosened round the roots, and superfluous plants thinned out, so as to give those that are left ample room to spread and fill the ground. In a month or two, when the flowers begin to open, a second hoeing is wanted to clean the ground; otherwise it gets foul and weedy. From that time little more is required, as the plants are then sufficiently advanced to keep down the weeds and receive little injury from them. Another ploughing in the interval between the two hoeings is always beneficial, by so well loosening and airing the soil. Very few plants are injured by ploughing between the rows, as the roots penetrate deeply and are not in the way of the plough; while any plant trodden down by the bullocks, the roots being uninjured, soon recovers. The seed should never be sown deeper than two inches, if simply covered it is enough. From three and a half to four feet between the rows is a good distance, as allowing the free use of the plough; heavier crops are so obtained than from closer sowing, the fruit setting and ripening

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better, and fewer flowers blighting and dropping off. A foot, or should the plant be vigorous, eighteen inches should be allowed between the plants. The "ridging" system does not answer, as it runs the water off too rapidly. After the autumn crop is picked, the ground should be deeply ploughed between the rows, and well exposed to air before the monsoon rains set in ; and should they be copious, may be again ploughed and afterwards hoed and weeded. The plants will then shoot afresh and bear another year ; but the second crop is seldom good and scarcely worth the cost in the interior at least On the coast, New Orleans Cotton has been known to yield better crops in the second year. The foregoing account refers to the cultivation in this district of American Cotton. The Native mode of cultivating Indigenous Cotton answers to it in all essential points. The ground is ploughed four or five times in April ; the seed sown early in October, but usually broad cast, and the ground again ploughed, and three times weeded during growth. At the first weeding five labourers are employed per acre ; at the second six ; and at the third four ; they are paid in grain. The picking occupies February and March, and is done at intervals of eight days at a time. Four labourers are employed per acre in picking, and one labourer will pick 12 lbs. of clean Cotton in the season. Generally speaking, from 150 to 250 lbs per acre is always looked upon as a full crop of Native seed Cotton, while from 350 to 500 lbs. is by no means unusual in the case of American in good soil and very dark coloured. Very light almost sandy alluvial loam, usually cultivated as rice fields, has been known to produce from 1,200 to 1,400 lbs. of seed Cotton (American) per acre. Three hundred pounds of seed Cotton represent 90 lbs. of clean Cotton. Cultivation to be profitable should yield 100 lbs. of ginned staple per acre. Gins give for Native Cotton about 21, and for American 29 per cent of Cotton to seed.

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Manure.—"No manure is used, nor any Cotton seed returned to the soil. The stalks are not allowed to decay on the ground. They are always plucked up and used by the Natives as firewood. 361

Diseases.—"With respect to Native Cotton, in November 362
and December the roots are liable to be attacked by a worm or grub, which kills the plant. In December too, the flowers and leaves are sometimes destroyed by a blight. Should too strong an east wind blow in January, February or March, the leaves fall, the plants droop, and the pods grow crooked. Cloudy rainy weather, when the pods burst spoils them. In American Cotton, the flowers are apt to be extensively destroyed by two beetles, of the genera cetonia and cantharis, that feed upon them; the pods, when ripening, are liable to be pierced by an insect, the larva of which, feeds on the inside; so that when they open, a large portion of the wool is stained rusty red and spoilt."

4th, Western strip or Malabar coast: three districts. 363
—The narrow strip of land between the western ghauts and Indian Ocean, is known by the general name of Malabar, and stretches from the little Native state of Cochin on the South, northwards to the frontiers of the Bombay Presidency. The physical features of this region, which is peculiarly open to the influence of the South-west monsoon, have already been described; as well as the results of the Cotton exploring expedition of Mr. Simpson, the American planter. The country is divided into three districts; viz.—(1) North Canara; (2) South Canara; (3) Malabar.

Paras. 7, 101,102.

Paras. 76, 78.

(1) North Canara: not a Cotton producing District. 364
—North Canara is not at present a Cotton producing district. The port of Coomptah on the coast is the outlet for nearly all the Cotton exported from Bellary and the Nizam's

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Mr. Fischer's letter, 12th April 1861.

dominions. The district is also the scene of an interesting experiment in the growth of foreign Cotton now under trial. The Collector reports that the lines of communication between the frontier of the neighbouring Cotton districts and the coast, are in better order than any beyond the boundary of the district. The principal road, namely, that between Dharwar and Coomptah, is bridged and metalled, and in good working order. Mr. Fischer adds,—"The obstacles to increased production seem to be uncertainty of local demand, the want of European capital and influence in the producing districts, and the absence of a direct shipping port on the coast. If European Agency and capital were to be found in the Cotton districts, there would be no difficulty in increasing the supply of Cotton. However great the demand may be at a distance, it has but a very indirect effect on the producing powers of the Ryot. If the demand exists at his own door, or within his own district, he has both the will and the industry to profit by it."

Captain Walker's letter, 19th November 1861.

365 **Report of the District Engineer on the experimental culture of Mr. Kleinknecht.**—The District Engineer reports "that Cotton soil in the usual acceptation of that term does not exist in this District, except possibly in small patches along portions of the Dharwar frontier near Moondagode and Hullial, wherever however Cotton is not actually grown, the ground being covered with jungle.

"But it is right to add that an experiment on a large scale for the growth of Cotton in jungle land below the Ghauts, has been in progress for a couple of seasons, under Mr. Kleinknecht, the Agent for Mr. Brooke, a Merchant of Bombay and Secretary to the Chamber of Commerce at that Port. None but the finest varieties of foreign seed are put down by Mr. Kleinknecht, and I have heard a very high opinion expressed of samples of his produce by the Agent of another Bombay Firm now at Beitkool. Mr. Brooke

and Mr. Kleinknecht appear to have studied the subject for some years past, and to have experimentally satisfied themselves as to the right season for planting, on which so much depends. So far as I am yet informed, Mr. Kleinknecht is sanguine of producing Cottons of superior staples, the high prices commended by which, and the cheapness as shipping them, will amply repay even the heavy cost of European superintendence, and of felling and weeding plantations cut in heavy jungle, and liable to an overgrowth of rank vegetation each monsoon.

" But the fullest particulars regarding this interesting and practical experiment will be afforded to Government by Mr. Kleinknecht himself, in competing for the prize offered in each Presidency for the encouragement of Cotton produce of the superior qualities. I will only add that should he prove successful, he will have opened a large field for speculators in the same line, as ground precisely similar to that operated upon by him is available along the banks of all our large rivers below the Ghaut, specially the Kalee Nuddee or Sedashegur river, the Gungawally, the Tuddey, and Honore rivers."

(2) South Canara: not a Cotton producing District.—South Canara produces but a very inconsiderable amount of Cotton, and that little is sown along with grain, and is used entirely in domestic manufactures. The quantity produced is indeed so small that none ever finds its way to the sea board for shipment; on the contrary it is imported largely from the port of Coomptah in North Canara. 366

Mr. Hodgson's letter, 6th December 1861.

(3) Malabar: not a Cotton producing District.—The Collector reports that Malabar is not a Cotton producing District. The article is however largely imported by land from the adjoining province of Coimbatore, chiefly for the purpose of exportation by sea to Bombay. 367

Mr. Grant's letter, 13th April 1861.

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368 **Native States: Mysore, Cochin, and Travancore.**—The Cotton grown in the Native States in the Madras Presidency is inconsiderable in quantity, and is almost entirely employed for domestic purposes. From the port of Cochin about 250,000 lbs. are annually exported to Bombay. The trade is entirely in the hands of the Shroffs or Native Bankers, who advance money to the cultivators, and thus keep the trade entirely to themselves.

Mr. Berry's letter, 13th November 1861.

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369 **Conclusion: general results.**—It seems expected that before bringing the present Hand-book to a close, the compiler should offer some opinion on the results of the experiments that have been made in the way of improving the Cotton staple in this country. In the preparation of the foregoing work, he has considered himself more in the light of a literary mechanic, condensing and arranging the subject matter in such a form as would render the facts most digestible to the general reader, than as possessing any special knowledge of Cotton beyond what might be required in the prosecution of his task. But still the analysis and comparison of facts naturally leads to certain convictions, and those convictions may perhaps be recorded with advantage.

370 **Four general conclusions.**—Four general conclusions appear to have been established, viz.—

1st, American Cotton can be grown, but the profit is questionable.

2nd, Indian Cotton may be improved, but only to a degree.

3rd, American Cotton must always command a higher price than Indian.

4th, The demand for Indian Cotton must always depend on the supply of American.

These four conclusions may be considered in order. CHAP. VI.

1st, American Cotton can be grown, but the profit is questionable.—The fact that American Cotton can be grown in the Madras Presidency, has been sufficiently proved by the numerous experiments that have been recorded; but the produce, though of good quality, has been very variable and disappointing as regards quantity. The question of profit however is a totally different one. Mr. David Lees produced much fine Cotton in Tinnevelly, but at a great pecuniary sacrifice. Captain Lawford again endeavoured to prove, that the cultivation of foreign Cotton would prove as profitable to the Ryot as that of grain, even on the more highly rented lands that are under an artificial system of irrigation. But the Ryots would not be convinced. Setting grain out of the question, the Ryot has hitherto found it more safe and profitable to grow Indigenous Cotton than to grow New Orleans Cotton. The cultivation of the Indigenous article is cheap and simple. The picking and separation of the staple from the seed costs literally nothing, for both operations are performed by hands which would be otherwise idle. The crop is tolerably certain, the staple clothes the family, the seed feeds the cattle, and the residue finds a ready market on the spot. On the other hand, American Cotton is a speculation. The cultivation is more difficult, the separation of the staple from the seed is more expensive, the crop is uncertain, the staple not in use amongst Native spinners, the seed popularly supposed to be unfit for cattle, and the market doubtful and distant. High prices on the spot would extend the cultivation of Indian Cotton, and perhaps promote the cultivation of American Cotton; but this is a question for the consideration, not of Government, but of the merchant and manufacturer.

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2nd. Indian Cotton may be improved, but only to a degree.—This inference, though it amounts to a con-
372 viction, is not so distinctly proved as the previous proposition. It has been stated that at one time the Cotton of India was of a finer quality than it is in the present day. This may be readily believed. In the olden time when Indian manufactured goods were in large demand, the Native manufacturers purchased the raw material upon the spot, and the prices varied according to quality. Thus the profit of the grower depended upon the quality of the wool, and more attention was naturally paid to the cultivation of the plant and cleanliness of the staple. Up to this point, and by means of a similar stimulus, the Indigenous Cotton may be improved in the present day, but no further. As a recent writer in a London paper has remarked, the Indigenous Cotton is the product of an Indian soil and climate, just as New Orleans is the product of an American soil and climate. The same writer also states that New Orleans Cotton grown in India has a tendency to degenerate, and to approximate year by year to the Indigenous article. To this it may be added that the Bourbon Cotton of the present day can scarcely be of the same quality as it was forty years ago, when "Hughes Tinnevelly Cotton" was quoted at high prices in the Liverpool market. Indeed it might be inferred that the crop is more or less precarious in proportion to the difference between the exotic plant and the Indigenous article. Accordingly it seems to be very nearly proved, that whilst an improved quality of the Indigenous Cotton can be produced with profit to the Ryot by a little more care in the selection of seed, in the cultivation of the plant, and in the cleanliness of the staple,—the soil, and climate of Southern India will never produce a reliable and permanent crop of Cotton equal to the New Orleans variety.

Economist, 25th January 1862.

3rd, American Cotton must always command a higher price than Indian.—This conclusion is already proved by what has been stated in support of the previous proposition. New Orleans Cotton is undoubtedly better than any which has as yet been produced in India. A pound of New Orleans makes much more yarn, and from the length of the staple can be twisted much more rapidly into yarn than a pound of Indian Cotton. Thus a pound of New Orleans Cotton must always fetch more than a pound of Indian Cotton, because it furnishes a larger quantity and a better quality of wool.

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4th, The demand for Indian Cotton must always depend upon the supply of American.—This conclusion may also be inferred from the previous propositions. The manufacturer will always prefer New Orleans to Indian Cotton; and Indian will only be purchased when New Orleans is scarce and too highly priced. The position of Indian Cotton in the English market is thus strictly a subsidiary one; and its utility to the manufacturer is more in the way of keeping down the price of New Orleans, than of being actually employed in the manufacture of goods. The tendency of New Orleans to rise in price is checked by the importation of Indian Cotton; and whenever the disparity of price is such that the same money's worth of Indian staple will make more money's worth of yarn than New Orleans, then the Indian will be largely in demand. The improvement of communications in India, and the large increase of Cotton cultivation in the latter country, will probably render the Indian Cotton better and cheaper; but until this Cotton can be laid down in Liverpool at such a price, and in such quantities, as to render the culture of American Cotton a loss to the Planter, the American will always hold its own, and the demand for Indian will depend upon the supply of American. Manchester looks to India 374

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for Cotton, not to supply her looms, but to keep down the price of the New Orleans staple.

375 **Political and commercial prospects of Indian Cotton.**—Upon this point, as on the others, the compiler merely expresses those convictions which have arisen in his mind during the prosecution of his present task. It is said that the moment the blockade of the Southern States is broken, the Indian Cotton will cease to be in demand. This may occur for a brief period, but is scarcely likely to be lasting. A panic may bring down the price of Indian Cotton to a minimum, but it is not so certain that the price of New Orleans will fall so low as to render the Indian quite a drug in the market. The Southern States have been so disorganised, and slavery has received such a blow, that we can scarcely expect that the American supply will be fully equal to the demand for a long time to come; and the weight of a national debt will probably be so heavy, that, without any direct duty on the transit of Cotton, prices must be higher than they have been hitherto. It is perhaps as well to bear these conditions in mind, inasmuch as it is greatly to be feared that the panic which may follow the opening of the Southern ports, will prove so disastrous to the Cotton cultivation in this country, as to undo all the good that has been effected by the recent stimulus to the Indian supply. With the expression of these convictions, the task of the compiler is brought to a close.

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APPENDIX I.

STATEMENT

SHOWING THE EXTENT

OF

COTTON CULTIVATION

IN THE SEVERAL DISTRICTS

OF THE

MADRAS PRESIDENCY,

FOR

EIGHT YEARS

FROM 1853-54 TO 1860-61.

STATEMENT *showing the Cultivation of Cotton in the Districts of the Madras the Annual Jammabundy Accounts*

	DISTRICTS.	GOVERNMENT 1853-54. Extent.	1853-54. Assess-ment.	1854-55. Extent.	1854-55. Assess-ment.	1855-56. Extent	1855-56. Assess-ment.	1856-57. Extent.
		Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.
1	Ganjam.. ...	2,574	2,996	2,482	4,218	2,647	3,828	3,066
2	Vizagapatam.	966	4,506	933	4,304	1,019	4,618	911
3	Rajahmundry	1,480	3,594	4,248	9,304	3,459	6,979	3,470
4	Masulipatam.	....	....	6,128	6,767	7,246	7,370	6,410
5	Guntoor. ..	55,206	79,678	54,862	81,102	63,570	96,799	60,877
6	Nellore......	2,786	5,181	3,955	6,064	3,513	4,360	3,742
7	Cuddapah. ..	42,233	60,862	47,962	71,414	40,554	56,041	44,224
8	Bellary......	1,32,585	1,56,909	1,04,578	1,26,778	73,544	89,114	1,50,927
9	Kurnool.....	66,023	76,148	64,641	72,755	59,739	66,935	70,835
10	Chingleput...	....	....	....	....	2	8	1
11	North Arcot..	....	....	21	67	35	63	32
12	South Arcot..	1,828	5,078	2,227	4,323	4,868	10,553	3,131
13	Tanjore.....	3,607	5,106	2,671	3,957	2,704	3,805	2,558
14	Trichinopoly.	5,950	8,956	6,060	9,866	5,188	7,951	6,172
15	Madura......	36,681	64,532	34,499	62,691	31,520	57,682	29,015
16	Tinnevelly...	1,23,836	1,08,120	1,24,932	1,10,483	1,14,969	1,04,408	1,11,576
17	Coimbatore..	1,03,196	1,66,360	1,04,559	161,311	1,22,457	1,40,455	80,417
18	Salem........	7,338	11,564	7,608	11,922	5,597	8,568	11,241
19	Canara......	....	....	....	....	....	....	....
20	Malabar.....	....	....	....	....	....	...	....
21	Madras.	....	....	....	....	....	....	...
	Total....	5,86,289	7,59,590	5,72,366	7,47,326	5,42,631	6,69,537	5,88,605

Presidency for the last eight years commencing from 1853-54 *prepared from received from the Collectors.*

Lands.

	1857-58.		1858-59.		1859-60.		1860-61.	
Assess-ment.	Extent.	Assess-ment.	Extent.	Assess-ment.	Extent.	Assess-ment.	Extent.	Assess-ment.
Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rups.
4,124	2,689	3,546	2,592	3,368	3,523	5,315	2,955	3,425
4,791	869	4,423	889	4,347	918	4,707	1,047	4,699
7,585	2,492	5,266	2,688	4,821	Godvy. 5,227	8,681	4,649	6,409
7,142	5,456	5,133	6,856	6,639	Kist. 88,449	1,34,836	80,312	1,24,200
93,168	62,926	95,961	76,196	1,20,722				
6,471	2,351	3,158	2,762	3,903	3,270	4,018	4,113	5,032
66,251	37,752	57,181	23,092	34,325	22,166	32,354	16,397	17,048
2,25,388	1,23,526	1,51,787	1,73,271	1,74,023	1,81,609	1,86,697	1,80,157	1,84,643
77,900	63,140	73,960	1,01,648	1,19,514	98,174	1,14,736	78,187	93,167
3	....	....	....	....	....	......	....	....
67	30	50	24	35	23	42	36	57
5,789	18,309	43,680	18,174	42,085	32,543	73,268	34,686	77,454
3,669	2,361	3,671	1,756	2,632	1,036	1,356	576	793
8,734	4,920	8,383	5,079	8,773	4,698	7,945	4,719	8,679
50,924	32,806	61,504	31,975	59,415	33,591	62,478	34,255	63,208
98,188	1,21,975	1,14,577	1,25,985	1,15,577	1,22,078	1,08,762	1,26,888	1,19,918
89,169	1,00,329	1,15,077	1,16,326	1,33,486	1,03,916	1,36,438	1,16,013	1,27,138
18,058	11,736	18,471	11,149	77,827	10,134	15,089	10,507	16,389
....	....	....	....	....	...	....	....	....
...	....	....	....	....	....	....	....	....
....	....	....	....	....	4	6	4	6
7,67,421	5,93,671	7,65,828	7,00,462	8,51,492	7,11,359	8,96,728	6,95,501	8,52,265

STATEMENT *showing the Cultivation of Cotton in the*

	Districts.	Inam 1853-54. Extent.	Assessment.	1854-55. Extent.	Assessment.	1855-56. Extent.	Assessment.	1856-57. Extent.
		Acres.	Rups.	Acres.	Rupees.	Acres.	Rupees.	Acres.
1	Ganjam.	138	....	153	190	186	309	125
2	Vizagapatam.	91	521	118	625	124	578	132
3	Rajahmundry	512	1,095	425	557	1,000	1,550	839
4	Masulipatam.	....	....	1,686	2,114	1,740	1,964	1,881
5	Guntoor.....	42,139	60,796	34,754	53,941	41,900	52,858	36,286
6	Nellore.	1,559	2,491	1,351	1,700	849	922	1,188
7	Cuddapah.. ..	25,338	41,280	27,090	41,682	25,277	39,715	30,857
8	Bellary.	81,069	1,18,104	62,262	87,476	50,564	72,754	1,09,650
9	Kurnool.....	41,075	8,671	39,818	11,421	40,498	8,466	45,573
10	Chingleput ..	....	....	....	....	....	....	....
11	North Arcot..	....	....	....	....	5	10	3
12	South Arcot .	3	7	....	....	7	15	1
13	Tanjore.... ...	178	....	99	....	65	....	99
14	Trichinopoly.	40	66	39	66	39	66	1,898
15	Mudura.	4,803	9,335	4,759	9,069	4,230	8,095	4,513
16	Tinnevelly ..	2,983	2,893	2,926	2,862	2,577	2,301	1,879
17	Coimbatore ..	8,904	11,371	93,58	11,294	11,749	12,011	9,739
18	Salem	41	106	17	30	13	19	48
19	Canara......	....	......	....	....	....	....	....
20	Malabar.. ..	....	....	....	....	....	....	....
21	Madras.	.....	....	....	....	....	....	....
	Total....	2,08,873	2,56,736	1,84,855	2,23,027	1,80,823	2.01,633	2,44,711

Districts of the Madras Presidency, &c.—(Continued.)

LANDS.

	1857-58.		1858-59.		1859-60.		1860-61.	
Assessment.	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.
Rups.	Acres.	Rups.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rups.
161	134	308	67	114	122	153	78	99
768	182	1,008	223	1,139	246	1,343	275	1,438
2,310	585	961	1,035	1,504	Godavy. 1,861	2,788	2,247	3,138
2,988	1,079	1,453	1,568	2,131	Kistnah.			
50,595	39,909	55,400	42,122	57,284	41,411	61,104	43,432	61,213
1,751	512	629	989	1,309	1,000	1,233	751	829
51,186	26,260	43,081	13,620	21,964	11,201	21,644	9,523	14,372
1,80,623	79,613	98,396	69,028	95,337	1,03,877	1,11,619	1,02,516	1,10,701
9,946	37,931	8,441	63,745	40,717	54,151	16,558	54,366	35,016
....	....	....	..	....	....	.....	....	......
9	2	6	5	9	1	5	5	14
8	7	47	2	5	655	1,933	225	653
....	40	....	....	....	....	....	......	...
3,381	510	617	749	1,311	1,098	1,538	915	1,549
8,526	5,067	9,583	4,761	9,429	5,119	9,778	3,830	7,523
1,998	3,724	2,953	12,883	15,860	9,441	9,989	12,286	12,388
9,817	12,437	12,202	13,142	12,745	13,869	12,086	14,685	12,692
66	39	57	65	195	61	195	66	186
....	....	....	....	....	...	......	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	...	....
3,24,133	2,08,031	2,35,142	2,24,052	2,61,053	2,44,113	2,51,966	2,45,200	2,61,811

STATEMENT *showing the Cultivation of Cotton in the*

	DISTRICTS.	ZEMINDARY							
		1853-54.		1854-55.		1855-56.		1856-57.	
		Extent.	Assess-ment.	Extent.	Assess-ment	Extent.	Assess-ment.	Extent.	Assess-ment.
		Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees	Acres.	Rupees
1	Ganjam	1,211	2,671	10	28	2,345	4,673	1,407	3,261
2	Vizagapatam.	4,247	30,289	3,959	30,104	3,960	29,897	4,066	31,455
3	Rajahmundry	2,912	6,569	4,248	9,790	3,765	8,823	3,453	8,140
4	Masulipatam.	...	..	..	...	468	190	731	284
5	Guntoor... ...	...	..	...	..	..	..	..	..
6	Nellore	6,885	6,396	8,390	7,641	9,816	8,449	9,196	7,700
7	Cuddapah. ...	58	119	60	101	77	142	..	..
8	Bellary.... ...	...	..	..	..	..	..	..	..
9	Kurnool... ...	...	..	..	..	...	..	..	..
10	Chingleput...	...	..	..	...	...	..	..	..
11	North Arcot..	...	..	7	4	1	1	31	70
12	South Arcot.	...	...	1	4	28	71	3	5
13	Tanjore.... ...	658	...	489	..	308	..	312	...
14	Trichinopoly.	7	20	...	..	..	..	...	..
15	Madura.... ...	39,572	51,251	39,890	53,630	16,266	21,971	36,444	50,313
16	Tinnevelly ...	6,821	8,495	6,777	8,406	7,492	9,046	47,580	58,561
17	Coimbatore...	1,819	3,612	1,610	3,380	1,714	2,948	897	1,846
18	Salem.......	6,529	10,073	6,174	8,980	4,881	7,417	611	1,366
19	Canara......	..	...	..	..	..	..	..	..
20	Malabar... ...	...	...	..	..	..	..	..	..
21	Madras.... ...	...	...	..	..	..	..	...	..
	Total...	70,719	1,19,495	71,618	1,22,068	51,121	93,628	1,04,731	1,63,001

Districts of the Madras Presidency, &c.—(Continued.)

Lands.							
1857-58.		1858-59.		1859-60.		1860-61.	
Extent.	Assess-ment.	Extent.	Assess-ment.	Extent.	Assess-ment.	Extent.	Assess-ment.
Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees.
2,174	4,797	1,427	3,164	1,124	3,057	1,645	4,194
4,363	32,240	3,998	28,949	5,572	29,096	3,473	27,040
3,436	8,841	2,890	7,506	Godavy. 5,657	12,682	5,761	10,970
1,151	521	1,303	907	Kistnah. 1,278	656	1,111	475
..	..	..	..				
8,243	7,052	8,224	7,780	8,933	7,509	8,865	7,945
..	...	..	..	..	...	..	..
..	..	..	..	..	..	..	...
..	...	..	..	..	..	..	..
..	..	..	...	..	..	..	..
35	79	25	56	31	73	..	..
..	..	..	..	..	..	..	..
43	..	..	..	..	...	..	..
..	..	..	..	..	..	..	..
36,710	50,665	39,079	53,193	38,449	53,887	43,165	62,020
69,151	73,428	56,022	59,648	52,806	56,200	49,168	49,309
897	1,846	2,243	3,538	2,301	3,730	1,535	2,809
4,279	7,401	1,998	4,207	5,019	7,186	5,134	7,467
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..
1,30,482	1,86,870	1,17,209	1,68,948	1,21,170	1,74,076	1,19,857	1,72,229

STATEMENT *showing the Cultivation of Cotton in the*

	Districts.	1853-54. Extent.	1853-54. Assess-ment.	1854-55. Extent.	1854-55. Assess-ment.	1855-56. Extent.	1855-56. Assess-ment.	To 1856- Extent.
		Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees,	Acres.
1	Ganjam	3,923	5,667	2,645	4,436	5,178	8,810	4,598
2	Vizagapatam.	5,304	35,316	5,010	35,033	5,104	35,093	5,109
3	Rajahmundry	4,904	11,257	8,921	19,651	8,224	17,352	7,762
4	Masulipatam.	..	..	7,814	8,881	9,454	9,524	9,022
5	Guntoor	97,345	1,40,474	89,616	1,35,043	1,05,470	1,49,657	97,163
6	Nellore	11,230	14,068	13,696	15,405	14,178	13,731	14,126
7	Cuddapah ..	67,629	1,02,261	75,112	1,13,197	65,908	95,898	75,801
8	Bellary	2,13,654	2,75,013	1,66,840	2,14,254	1,24,108	1,61,868	2,60,577
9	Kurnool	1,07,098	84,819	1,04,459	84,176	1,00,237	75,401	1,16,408
10	Chingleput...	..	..	...	..	2	8	1
11	North Arcot.	..	..	28	71	41	74	66
12	South Arcot.	1,831	5,015	2,228	4,327	4,903	10,639	3,135
13	Tanjore	4,443	5,106	3,259	3,957	3,077	3,805	2,969
14	Trichinopoly.	5,997	9,042	6,099	9,932	5,227	8,017	8,070
15	Madura	81,056	1,25,118	79,151	1,25,390	52,016	87,748	69,972
16	Tinnevelly ..	1,33,640	1,19,508	1,34,634	1,21,751	1,25,038	1,15,755	1,61,035
17	Coimbatore..	1,13,919	1,81,343	1,15,527	1,75,985	1,35,920	1,55,414	91,053
18	Salem	13,908	21,743	13,799	20,932	10,491	16,004	11,900
19	Canara	..	..	..	..	..	..	..
20	Malabar	..	..	..	...	..	..	..
21	Madras	.	...	..	..	..	..	...
	Total..	8,65,881	11,35,820	8,28,838	10,92,421	7,74,575	9,64,798	9,38,047

Districts of the Madras Presidency, &c.—(Continued.)

TAL. 57.	1857-58.		1858-59.		1859-60.		1860-61.	
Assessment.	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.
Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rupees.	Acres.	Rups.
7,546	4,997	8,651	4,086	6,646	4,769	8,525	4,678	7,718
37,014	5,414	37,671	5,110	34,435	6,736	35,146	4,791	33,177
18,035	6,513	15,068	6,613	13,831	Godvy. 12,745	24,151	12,657	20,517
10,414	7,686	7,107	9,727	9,677	Kistnah. 1,31,138	1,96,596	1,24,855	1,85,888
1,43,763	1,02,835	1,51,361	1,18,318	1,78,006				
15,922	11,106	10,839	11,975	12,992	13,203	12,760	13,729	13,806
1,17,437	64,012	1,00,262	36,712	56,289	33,367	53,998	25,920	31,420
4,06,011	2,03,139	2,50,183	2,42,299	2,69,360	2,85,486	2,98,316	2,82,673	2,95,344
87,846	1,01,071	82,401	1,65,393	1,60,231	1,52,325	1,31,294	1,32,553	1,28,183
3	...	..	..	..	...	..	..	..
146	67	135	54	100	55	120	41	71
5,802	18,316	43,727	18,176	42,090	33,198	75,201	34,911	78,107
3,609	2,444	3,671	1,756	2,632	1,036	1,356	576	793
12,115	5,430	9,000	5,873	10,084	5,796	9,483	5,634	10,228
1,09,763	74,583	1,21,752	75,818	1,22,037	77,159	1,26,143	81,250	1,32,751
1,58,747	1,94,850	1,90,958	1,94,890	1,91,085	1,84,325	1,74,951	1,88,342	1,81,615
1,00,832	1,13,663	1,29,125	1,31,711	1,49,769	1,20,086	1,52,254	1,32,233	1,42,639
19,489	16,054	25,929	13,212	22,229	15,214	22,470	15,707	24,042
...	...	..	...	...	..	..	..	...
..	..	..	..	..	..	..	..	...
..	..	..	...	..	4	6	4	6
12,54,554	9,32,180	11,87,840	10,41,723	12,81,493	10,76,642	13,22,770	10,60,557	12,86,305

W. HUDLESTON, *Secretary Board of Revenue.*

APPENDIX II.

Statement showing the average assessment per acre of dry lands in each district of the Presidency prepared from the settlement returns for 1859-60.

No.	Districts.	Average assessment per acre.			Do. in English money.		
		Rs.	As.	P.	£	*s.*	*d.*
1	Ganjam..........................	1	3	8*	0	2	5½
2	Vizagapatam......................	3	15	9*	0	7	11⅝
3	Godavery District................	2	13	11*	0	5	8⅞
4	Kristna District.................	1	7	8	0	2	11½
5	Nellore..........................	1	6	4	0	2	9½
6	Cuddapah.........................	0	11	10	0	1	5¾
7	Bellary..........................	0	10	5	0	1	3⅝
8	Kurnool..........................	0	15	10	0	1	11¾
9	Madras...........................	1	8	0	0	3	0
10	North Arcot......................	1	6	9	0	2	10⅛
11	South Arcot......................	1	15	4	0	3	11
12	Tanjore..........................	1	2	7	0	2	3⅞
13	Trichinopoly.....................	1	13	0	0	3	7½
14	Madura...........................	1	5	6	0	2	8¼
15	Tinnevelly.......................	0	13	0	0	1	7½
16	Coimbatore.......................	0	14	6	0	1	9¾
17	Salem............................	1	4	8	0	2	7

* The Government assessment on the three Districts of Ganjam, Vizagapatam, and Godavery, does not include the Zemindaries, which constitute in Ganjam and Vizagapatam the largest and in the Godavery a very large part of the District.

APPEN

Districts.		Average price of Cotton freed from seed at the principal mart or marts of the district.	Average price at which it is sold by the Ryots. With Advances. Cleaned Cotton.	With Advances. Uncleaned Cotton.	Without Advances. Cleaned Cotton.	Without Advances. Uncleaned Cotton.
		£ s. d.	£. s, d	£. s. d.	£. s. d.	£. s. d.
Nellore....	Per 500 lbs.	....	....	....	....	....
	Per 25 lbs.	0 4 $1\frac{5}{8}$	0 3 9	0 1 0	0 4 $2\frac{1}{8}$	0 1 5
Guntoor.... (Kristna)	Per 500 lbs.	2 19 0	2 13 $1\frac{1}{2}$	0 13 $4\frac{1}{2}$	2 17 $7\frac{7}{8}$	0 15 0
	Per 25 lbs.	0 2 $11\frac{3}{8}$	0 2 $7\frac{7}{8}$	0 0 8	0 2 $10\frac{19}{32}$	0 0 9
Cuddapah...	Per 500 lbs.	4 6 0	3 10 0	1 2 0	3 18 0	1 4 0
	Per 25 lbs.	0 4 $3\frac{19}{32}$	0 3 6	0 1 $1\frac{3}{16}$	0 3 $10\frac{25}{32}$	0 1 $2\frac{13}{32}$
Kurnool....	Per 25 lbs.	0 3 $3\frac{5}{8}$	0 3 $2\frac{3}{8}$	0 0 $9\frac{1}{2}$	0 3 4	0 0 $9\frac{7}{8}$
Bellary.....	Per 25 lbs.	0 3 $1\frac{1}{8}$	0 2 $8\frac{1}{8}$	....	0 2 $11\frac{1}{8}$	....
Madura....	Per 25 lbs.	......	....	....	....	0 14 0 ℔ $316\frac{3}{16}$ lbs. or about 1s. $1\frac{1}{3}$d. per 25 lbs.
Coimbatore	Per 500 lbs.	4 11 $8\frac{3}{4}$	....	1 4 $10\frac{1}{8}$	....	0 2 0
	Per 25 lbs.	0 4 7		0 1 3	....	....
Tinnevelly..	Per 500 lbs.	£4 14*s.* to 5£	4 0 0	1 2 0	4 14 0	1 4 $0\frac{13}{32}$
	Per 25 lbs.	4*s.* $8\frac{13}{32}$*d.* to 5*s.*	0 4 0	0 1 $1\frac{3}{16}$	0 4 $8\frac{13}{32}$	0 1 2

DIX III.

Cost of Cleaning.	Expense of conveyance to the nearest port of shipment for every ten miles.	Average Produce per acre.	Extent of land in Acres.	
			Under cultivation.	Capable of producing Cotton.
£. s. d.	£. s. d.			
......	0 0 $8\frac{7}{8}$	111 lbs. $11\frac{1}{2}$ oz. Uncleaned.	596	——
0 0 $3\frac{3}{8}$ (Uncleaned.)	0 0 $0\frac{7}{16}$			
0 6 $4\frac{7}{16}$	0 4 $8\frac{1}{16}$	233 lbs. 2 oz. (Uncleaned.)	47,299	102,646
0 0 $3\frac{13}{16}$ (Uncleaned.)	0 0 $2\frac{13}{16}$		21	41
0 3 4	0 17 3 by bandy and 1 8 9 by bullocks.	200 lbs. (Uncleaned.)	79,562	219,587
0 0 2 (Uncleaned.)	0 0 $10\frac{11}{32}$			
0 0 1 (Uncleaned.)	0 0 $7\frac{13}{16}$	112 lbs. 8 oz. (Uncleaned.)	19,831	75,481
0 0 $5\frac{1}{4}$	0 1 9 to Coompta.	46 lbs. 5 oz. (Cleaned.)	260,000	400,000
0 4 $10\frac{7}{8}$ per 243 lbs. of cleaned cotton, or about 6d. per 25 lbs.; but this is more than met by the value of the seed.	0 6 0 6s.6d. in rains ⅌ cart-load or 4 bales of $243\frac{3}{4}$ lbs. each; or $1\frac{7}{8}$d. per 25 lbs. to Tuticorin.	316 lbs 12 oz. (Uncleaned.)	48,747 including Ramnad and Shevagunga	60,747
0 3 0	0 13 0	....	97,830	not specified but to a great extent
0 0 $1\frac{13}{16}$	0 0 $7\frac{13}{16}$	110 lbs. (Uncleaned.)		
0 10 0	0 12 0	75 lbs. Cleaned.	122,391	137,391
0 0 6	0 0 $7\frac{3}{16}$	300 lbs. (Uncleaned.)		

APPENDIX IV.

Statement of Cotton Exported from the several ports of the Madras Presidency to Foreign and Indian Ports.
From 1847-48 *to* 1860-61.

1847-48.				Quantity in lbs.	Value in Rs.
1.	Fort St. George	to	United Kingdom...............	1,993,712	2,15,321
	,,		Ceylon........................	531,664	57,420
	,,		China...........................	1,544,144	166,768
	,,		France..........................	1,456	129
	,,		Penang, Singapore and Malacca..................	130,256	14,068
	,,		Indian French Ports..........	256,368	17,279
			Total......	4,457,600	470,985
2.	Rajahmundry	to	Penang, Singagore and Malacca..........................	2,841	554
	,,		Bengal...........................	7,828	627
	,,		Indian French Ports..........	200	16
	,,		Pegu.............................	1,078	210
			Total......	11,947	1,407
3.	Tanjore	to	Ceylon..........................	150	6
	,,		Penang, Singapore and Malacca..........................	10,919	1,625
			Total......	11,069	1,631
4.	Tinnevelly	to	United Kingdom...	960,900	134,526
	,,		Ceylon...........................	8,141	1,139
	,,		China...........................	4,066,450	692,810
	,,		Indian French Ports..........	154,000	21,560
	,,		Travancore.....................	4,275	599
			Total......	5,193,766	850,634
5.	Malabar	to	United Kingdom...............	193,134	31,774
	,,		Maldive Islands...............	1,531	252
	,,		Mauritius and Bourbon......	16,702	3,103
	,,		Bombay.........................	148,434	30,528
	,,		Travancore.....................	8,536	1,540
			Total......	368,337	67,197

1847-48.—Continued.			Quantity in lbs.	Value in Rs.
6. Canara	to	Bombay	14,345,052	1,305,629
,,		Travancore	59,320	4,432
		Total	14,404,372	1,310,061

1848-49.			Qaantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom	500,196	63,193
,,		China	359,080	35,938
,,		Penang, Singapore and Malacca	446,778	50,622
,,		Bengal	25,209	2,566
,,		Indian French Ports	186,479	14,260
		Total	1,517,742	166,579
2. Masulipatam	to	Bengal ... Total	31,049	2,298
3. Tinnevelly	to	United Kingdom	2,190,239	306,641
,,		Ceylon	6,562	919
,,		China	7,442,463	1,041,945
,,		Indian French Ports	414,075	57,971
		Total	10,053,339	1,407,476
4. Malabar	to	United Kingdom	343,293	70,603
,,		Maldive Islands	964	194
,,		Mauritius and Bourbon	1,180	243
,,		Bombay	1,096,659	225,053
,,		Travancore	75,990	11,943
		Total	1,518,086	308,036
5. Canara	to	Bombay	4,908,486	390,338
,,		Travancore	20,222	1,409
		Total	4,928,708	391,747

1849-50.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom............	2,718,488	256,882
,,		China...........	591,325	47,963
,,		France.........	15,000	1,350
,,		Penang, Singapore and Malacca................	117,900	10,321
,,		Bengal.....	1,640,700	153,393
,,		Indian French Ports........	431,072	38,173
		Total......	5,514,485	508.082
2. RAJAHMUNDRY	to	Bengal......... Total......	24,380	1,821
3. MASULIPATAM	to	Bengal......... Total......	60,992	4,548
4. SOUTH ARCOT	to	United Kingdom. Total...	210,000	29,400
5. TANJORE	to	Penang, Singapore and Malacca..................	11,500	1,646
6. MADURA	to	Ceylon......... Total......	57,604	12,104
7. TINNEVELLY	to	United Kingdom.............	1,988,125	208,338
,,		Ceylon........................	150,425	21,059
,,		China...........................	7,085,143	991,920
		Total......	9,223,693	1,221,317
8. MALABAR	to	United Kingdom............	109,410	22,130
,,		Maldive Islands...	720	148
,,		Mauritius and Bourbon....	9,340	1,561
,,		Bombay........	231,590	47,632
,,		Travancore.......	24,080	3,076
		Total.....	375,140	74,547
9. CANARA	to	Bombay...... Total....	21,949,074	2,252,650

1850-51.			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom.........	5,010,290	575,144
,,		China..................	5,426,850	651,501
,,		France..................	255,900	38,367
,,		Penang, Singapore and Malacca...........	299,400	32,670
,,		Bengal	1,363,500	171,425
,,		Indian French Ports.....	182,462	22,301
		Total....	12,538,402	1,491,408
2. Masulipatam	to	Bengal....... Total....	43,728	4,189
3. Tinnevelly	to	United Kingdom.........	3,646,639	510,529
,,		Ceylon.................	679,525	91,134
,,		China..................	3,728,500	521,990
		Total....	8,054,664	1,127,653
4. Malabar	to	United Kingdom.........	380,960	77,749
,,		Maldive Islands.........	640	123
,,		Mauritius and Bourbon..	7,600	1,571
,,		Bombay..................	177,920	36,314
,,		Travancore..............	14,231	2,159
		Total....	581,350	117,916
5. Canara	to	Arabian Gulf............	2,216	270
,,		Bombay..................	23,960,244	3,081,354
		Total....	23,970,460	3,081,624

1851-52.			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom.........	1,804,950	196,637
,,		China..................	3,672,203	367,963
,,		France..................	48,000	5,709
,,		Penang, Singapore and Malacca...........	1,331,100	145,457
,,		Bengal	900,800	99,086
,,		Indian French Ports.....	300,507	30,505
		Total....	8,057,560	845,357
2. Masulipatam	to	Bengal........Total....	56,878	4,550

1851-52.—Continued.			Quantity in lbs.	Value in Rs.
3. Tinnevelly	to	United Kingdom.........	2,476,450	346,703
,,		Ceylon.................	361,834	50.657
,,		China..................	6,980,950	977,333
,,		Penang, Singapore and Malacca...............	237,700	33,278
,,		Bombay..............	32,100	4,494
,,		Indian French Ports.....	45,000	6,300
		Total....	10,134,034	1,418,765
4. Malabar	to	United Kingdom..........	350,980	72,064
,,		Maldive Islands..........	730	138
,,		Mauritius and Bourbon...	6,300	1,296
,,		Bombay.................	929,740	191,215
,,		Travancore..............	29,092	3,570
		Total....	1,316,842	268,283
5. Canara	to	Arabian Gulf............	22,323	2,126
,,		Bombay.................	15,767,616	1,496,136
		Total....	15,793,938	1,498,262

1852-53			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom........	11,184,613	1,140,580
,,		China.................	3,251,700	274,841
,,		Penang, Singapore and Malacca............	344,575	33,982
,,		Bengal..............	834,423	90,887
,,		Indian French Ports....	604,823	59,371
		Total....	16,220,134	1,599,661
2. Vizagapatam	to	United Kingdom.........	13,577	1,237
,,		Bengal...............	7,035	640
		Total....	20,612	1,877
3. South Arcot	to	United Kingdom........	66,000	9,240

1852-53.—Continued.			Quantity in lbs.	Value in Rs.
4. TINNEVELLY	to	United Kingdom....	4,863,007	680,821
"		Ceylon......	1,266,875	177,362
"		China........	9,774,402	1,370,437
"		Penang, Singapore and Malacca........	305,300	42,714
"		Bombay..............	44,350	6,209
"		Indian French Ports.. ..	45,112	6,300
		Total ...	16,299,046	2,283,843
5. MALABAR	to	United Kingdom...... ..	448,000	86,839
"		America..........	31,944	6,871
"		Maldive Islands	1,440	237
"		Mauritius and Bourbon..	1,512	296
"		Bombay	2,352,000	420,167
"		Concan......	880	145
"		Travancore......	55,200	9,010
		Total.....	2,893,976	523,565
6. CANARA	to	Arabian Gulf..	34,272	3,404
"		Bombay..............	40,511,917	4,241,369
"		Travancore......	22,041	2,112
		Total....	40,568,230	4,246,885

1853-54.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom....	4,009,526	465,991
"		Penang, Singapore and Malacca....	146,100	17,464
"		Bengal	323,200	34,457
"		Indian French Ports....	207,300	20,007
		Total...	4,686,126	537,919
2. TINNEVELLY	to	United Kingdom........	4,471,850	626,059
"		Ceylon......	693,406	96,077
"		China........	2,480,400	347,256
"		Indian French Ports....	59,250	8,295
		Total.. .	7,704,906	1,077,687

1853-54.—Continued.			Quantity in lbs.	Value in Rs.
3. MALABAR	to	United Kingdom	222,608	45,778
,,		Arabian Gulf............	3,200	659
,,		Germany......	97,360	20,023
,,		Maldive Islands.... ...	1,338	275
,,		Bombay.......	1,457,410	299,477
,,		Concan......	2,440	372
,,		Cutch........	980	202
,,		Indian French Ports.. .	1,365	146
,,		Travancore........	63,420	7,159
		Total... ..	1,850,121	374,091
4. CANARA	to	Arabian Gulf......	60,428	5,071
,,		Bombay......	17,024,259	1,790,614
		Total......	17,084,687	1,795,685

1854-55.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom.........	1,602,505	157,219
,,		Penang, Singapore and Malacca........	1,081,000	113,973
,,		Bengal......	752,250	82,861
,,		Bombay........	30,000	4,800
,,		Indian French Ports....	41,100	4,768
		Total....	3,506,855	363,621
2. TINNEVELLY	to	United Kingdom.... ..	6,351,930	877,604
,,		Ceylon	1,038,977	145,457
,,		China	1,711,500	239,610
,,		Penang, Singapore and Malacca........	985,500	137,970
,,		Bombay........	37,500	5,250
,,		Indian French Ports.. ..	217,125	30,398
,,		Travancore...	473	67
		Total....	10,343,005	1,436,356

1854-55.—Continued.			Quantity in lbs.	Value in Rs.
3. MALABAR	to	United Kingdom........	51,600	10,085
,,		France......	32,400	6,664
,,		Maldive Islands....... ..	460	95
,,		Bombay......	5,880	1,209
,,		Concan....	2,200	453
,,		Travancore........	31,688	5,511
		Total ...	1,24,228	24,017
4. CANARA	to	Arabian Gulf.......	25,439	2,287
,,		Ceylon	45,202	3,937
,,		Bombay.............	12,804,666	1,289,207
		Total....	12,875,307	1,295,431

1855-56.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom	1,810,600	163,486
,,		China..	54,000	6,000
,,		Penang, Singapore and Malacca	571,425	54,752
,,		Bengal......	215,900	30,084
		Total....	2,651,925	254,322
2. TINNEVELLY	to	United Kingdom..	2,848,516	398,804
,,		Ceylon.....	1,200,146	168,126
,,		Penang, Singapore and Malacca............	480,607	67,284
,,		Bombay.......	430,200	60,228
,,		Travancore....	250	35
		Total....	4,959,719	694,477
3. MALABAR	to	United Kingdom	133,272	26,706
,,		Ceylon.........	46,800	7,700
,,		France........	1,800	370
,,		Maldive Islands...... ..	1,250	257
,,		Bombay...........	352,120	72,418
,,		Travancore......	6,960	1,348
		Total ...	542,202	108,799

1855-56.—Continued.			Quantity in lbs.	Value in Rs.
4. Canara	to	Arabian Gulf........ ...	1,148	120
,,		Bombay................ ..	12,858,356	1,463,611
,,		Goa............	114	22
		Total....	12,859,618	1,463,753

1856-57.			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom.	6,190,844	722,006
,,		France	5,999	720
,,		Hamburg....	69,000	8,625
,,		Penang, Singapore and Malacca......	3,299	550
,,		Bengal....	563,500	78,098
		Total....	6,832,642	809,999
2. Tinnevelly	to	United Kingdom........	13,287,731	1,865,952
,,		Ceylon....	2,404,200	336,588
,,		China.................	1,003,200	140,448
,,		Holland..........	240,000	33,600
,,		Penang, Singapore and Malacca........	229,500	32,130
,,		Indian French Ports....	127,125	17,797
		Total....	17,291,756	2,426,515
3. Malabar	to	United Kingdom.........	118,727	22,842
,,		Arabian Gulf....	410	82
,,		Maldive Islands.....	436	74
,,		Bombay........	1,065,218	216,358
,,		Concan......	982	191
,,		Travancore......	5,920	1,218
		Total....	1,191,693	240,765
4. Canara	to	Bombay..... Total....	28,671,974	3,745,007

1857-58.			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom..	5,533,100	707,188
,,		France......	1,655,300	219,439
,,		Hamburg...............	55,500	6,978
,,		Penang, Singapore and Malacca............	102,300	16,243
,,		Bengal.....	1,887,508	267,145
		Total....	9,233,708	1,216,993
2. Vizagapatam	to	Bengal........	40,929	3,110
3. Rajahmundry	to	United Kingdom..	202,800	26,734
,,		France	5,100	888
,,		Bengal	18,456	2,128
		Total....	2,26,356	29,750
4. Masulipatam	to	Bengal...... Total....	31,500	3,690
5. Nellore	to	Bengal	24,887	2,716
6. Tinnevelly	to	United Kingdom..........	4,646,846	650,558
,,		Ceylon....	1,928,503	269,990
,,		China	651,600	91,224
,,		France.....	2,586,000	362,040
,,		Hamburg....	351,000	49,140
,,		Holland.............	425,000	59,500
,,		Penang, Singapore and Malacca....	48,902	6,846
,,		Indian French Ports..	525,390	73,542
,,		Travancore.............	696,000	97,440
		Total....	11,859,239	1,660,280
7. Malabar	to	United Kingdom........	98,293	19,653
,,		France....	14,194	2,838
,,		Maldive Islands..	164	33
,,		Bombay.......	147,282	29,438
,,		Travancore....	2,305	461
		Total ...	262,237	52,423

1857-58.—Continued.			Quantity in lbs.	Value in Rs.
8. CANARA	to	United Kingdom....	862,226	134,542
,,		Bombay....	32,474,317	5,668,220
		Total....	33,336,543	5,802,762

1858-59.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom.........	33,000	5,340
,,		Bengal......	5,528,096	957,321
,,		Indian French Ports....	57,300	9,172
		Total ...	5,618,396	971,833
2. VIZAGAPATAM	to	Bengal...... Total......	246	25
3. RAJAHMUNDRY	to	United Kingdom........	46,500	7,668
,,		Bengal.......	50,100	7,014
		Total....	96,600	14,682
4. TINNEVELLY	to	United Kingdom.........	6,177,550	865,046
,,		Ceylon.........	1,634,800	228,872
,,		China	3,596,400	503,496
,,		France....	2,386,500	334,110
,,		Bengal......	351,600	49,224
,,		Indian French Ports....	221,536	31,022
,,		Travancore....	19,250	2,695
		Total....	14,387,636	2,014,465
5. MALABAR	to	United Kingdom....	14,105	2,820
,,		Maldive Islands....	328	66
,,		Bombay................	732,690	146,556
,,		Concan...........	2,467	494
,,		Travancore..	5,922	1,184
		Total....	755,512	151,120

1858-59.—Continued.			Quantity in lbs.	Value in Rs.
6. CANARA	to	United Kingdom........ ..	161,198	26,068
,,		Arabian Gulf..	1,894	308
,,		Bombay..................	17,571,060	2,939,401
		Total....	17,734,152	2,965,777

1859-60.			Quantity in lbs.	Value in Rs.
1. FORT ST. GEORGE	to	United Kingdom.....	3,104,368	456,886
,,		France........	465,600	63,007
,,		Penang, Singapore and Malacca...... , ...	92,700	16,108
,,		Bengal	4,136,900	725,056
,,		Indian French Ports....	160,800	25,428
		Total.. .	7,960,368	1,286,485
2. VIZAGAPATAM	to	Bengal...... Total....	40,758	7,832
3. GODAVERY	to	France....... Total......	3,000	360
4. KRISTNA	to	Bengal...... Total....	198,670	15,913
5. NELLORE	to	Bengal........ Total....	21,075	2,300
6. TINNEVELLY	to	United Kingdom....... ...	13,532,022	1,901,824
,,		Ceylon..............	907,977	127,834
,,		China........	1,120,516	293,034
,,		France....................	1,074,444	150,766
,,		Holland..........	785,509	110,040
,,		Bengal........	1,027,532	144,186
,,		Indian French Ports....	114,546	16,117
		Total....	18,562,546	2,743,801
7. MALABAR	to	United Kingdom....	26,450	4,486
,,		Maldive Islands....	164	26
,,		Bombay....	2,424,141	484,710
,,		Travancore.......	10,857	2,171
		Total.....	2,461,612	491,393
8. CANARA	to	Bombay..... Total....	33,264,498	5,049,051

1860-61.			Quantity in lbs.	Value in Rs.
1. Fort St. George	to	United Kingdom........	6,065,919	774,814
„		China............	768,800	103,953
„		France....	983,700	106,812
„		Penang, Singapore and Malacca	36,000	4,800
„		Bengal	3,190,610	421,577
„		Chittagong......	8,725	687
„		Indian French Ports....	118,500	14,317
		Total.....	11,172,254	1,426,960
2. Ganjam	to	Bengal...... Total....	18,320	2,290
3. Vizagapatam	to	Bengal...... Total.....	108,756	12,738
4. Rajahmundry	to	United Kingdom........	40,794	4,079
„		France......	52,512	5,302
„		Bengal......	293,398	28,173
„		Indian French Ports...	17,400	1,808
„		Moulmein........	123	15
		Total....	404,227	39,377
5. Masulipatam	to	Bengal...... Total....	458,070	36,677
6. Tinnevelly	to	United Kingdom.......	7,266,585	1,019,650
„		Ceylon.........	1,013,738	142,247
„		China......	5,023,415	704,886
„		Bengal.........	59,864	8,400
„		Indian French Ports....	26,342	3,696
		Total....	13,389,94	1,878 879
7. Malabar	to	United Kingdom..... ..	159,984	28,072
„		Maldive Islands...... ..	784	105
„		Mauritius and Bourbon...	5,922	948
„		Bombay....	2,073,439	425,295
		Total....	2,240,129	454,420
8. Canara	to	Bombay.......	51,029,068	7,439,822
„		Goa....	1,312	48
		Total ...	51,030,380	7,439,870

APPENDIX V.*

No. 1.—*Statement shewing the Increase in the Cultivation of Cotton in the United States.*

		Bales grown in America.		Bales consumed in America.
1845- 6	...	2,100,537	...	422,597
1846- 7	...	1,778,651	...	427,967
1847- 8	...	2,347,634	...	531,772
1848- 9	...	2,728,896	...	518,039
1849-50	...	2,096,706	...	487,769
1850-51	...	2,355,257	...	404,108
1851-52	...	3,015,029	...	603,029
1852-53	...	3,262,882	...	671,009
1853-54	...	2,930,027	...	610,571
1854-55	...	2,847,339	...	593,584
1855-56	...	3,527,845	...	652,739
1856-57	...	2,939,519	...	702,138
1857-58	...	3,113,962	...	595,562
1858-59	...	3,851,081	...	760,218
1859-60	...	4,825,924	...	810,343
1860-61	...	3,866,000	...	843,740

The shipping season in America commences from the 1st September, and the above tables are made up from 1st September to 31st August.

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* For the data furnished in this portion of the appendix, the compiler is indebted to R. A. Robinson, Esq., of Madras.

No. 2.—*Import of Cotton into the United Kingdom from 1st January to 31st December of the following years.*

	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860
	Bales										
American.......	1,181,956	1,396,168	1,784,388	1,532,034	1,667,509	1,621,405	1,758,295	1,478,437	1,854,004	2,084,991	2,579,759
Brazil.....	171,221	108,648	144,442	132,245	107,487	134,888	122,411	175,078	106,319	124,676	101,623
West Indies....	5,770	8,982	10,174	9,549	8,746	8,770	11,320	11,016	7,406	6,809	9,929
Egyptian.......	79,401	64,015	189,335	105,494	81,218	115,002	111,960	75,528	105,422	101,410	110,009
East India......	299,142	325,662	213,183	485,395	308,178	395,490	463,932	681,378	357,697	510,603	562,674
Total Import..	1,737,490	1,903,475	2,341,522	2,264,717	2,173,138	2,275,553	2,467,918	2,421,487	2,430,848	2,828,489	3,363,994
Total Export..	270,737	268,617	282,516	349,549	317,152	316,910	360,800	337,196	343,602	436,017	609,000

No. 3.—*Average Weekly Delivery for Consumption in Great Britain.*

	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861
	Bales											
American....................	20,704	24,460	28,855	27,114	29,360	30,304	32,422	25,952	31,336	36,674	43,100	32,800
East India....................	3,362	3,706	2,972	3,739	3,994	5,313	5,400	6,981	6,140	4,043	3,400	6,450
Brazil, Egyptian &c............	5,037	3,784	4,636	4,822	4,129	4,702	5,656	4,846	4,115	3,417	4,100	4,109
Total....	29,103	31,950	36,463	35,675	37,483	40,319	43,478	37,779	41,591	44,134	50,600	43,350

No. 4.—Prices of Cotton per £. in Liverpool in 31st December of each of the following years.

	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861
Orleans.	$6\frac{1}{2}$ to 9d.	$3\frac{1}{2}$ to 7	4 to $7\frac{1}{2}$	$3\frac{1}{2}$ to 8	$3\frac{1}{4}$ to $7\frac{1}{2}$	$4\frac{1}{4}$ to 8	6 to 9	$3\frac{1}{2}$ to 8	5 to 8	4 to $8\frac{1}{2}$	$4\frac{3}{4}$ to 9	9 to $13\frac{1}{2}$
Surat.	$4\frac{1}{2}$ to $6\frac{3}{8}$	$2\frac{1}{4}$ to 4	3 to 5	$2\frac{1}{2}$ to $4\frac{3}{4}$	$2\frac{1}{4}$ to $4\frac{1}{4}$	3 to 5	$4\frac{3}{4}$ to $5\frac{3}{4}$	$2\frac{1}{2}$ to 5	5 to $6\frac{1}{4}$	$3\frac{1}{2}$ to $5\frac{1}{2}$	$4\frac{1}{4}$ to $5\frac{3}{4}$	$5\frac{3}{4}$ to $9\frac{1}{2}$

APPENDIX VI.

METEOROLOGICAL AVERAGES

Deduced from twenty years observations at the Madras Observatory.

1841 to 1861.	Atmospheric pressure reduced to 32°.	Mean Temperature.	Wet Bulb Thermometer.	Dew Point.	Per-centage of Humidity.	Rain Fall.
January..............	29·997	75·3	69·5	66·6	76	0·96
February..............	29·970	76·9	70·9	68·0	75	0·25
March..............	29·903	80·6	74·6	72·0	76	0·42
April..............	29·825	84·2	78·0	75·6	76	0·67
May..............	29·729	86·4	78·5	75·5	71	2·26
June..............	29·698	86·5	77·1	73·3	66	1·73
July..............	29·715	84·8	76·5	73·1	69	3·60
August..............	29·751	83·8	76·6	73·7	72	4·37
September..............	29·779	83·3	76·6	73·9	74	4·54
October..............	29·849	80·6	75·9	74·0	81	11·37
November..............	29·932	77·6	72·5	70·2	79	12·73
December..............	29·977	75·6	70·2	67·5	77	5·73
Annual..............	29·844	81·3	74·7	71·9	75	48·63

The preceding table contains the mean or average results of a series of hourly observations continued for twenty years, viz., from 1841 to 1861. The cistern of the Barometer is twenty-seven feet above the mean sea level. It appears upon inspection of the column of atmospheric pressure, that after

being duly corrected to the usual standard temperature of 32° Fahrenheit, the Barometer reads highest in January, and lowest in June; which are respectively the coolest and hottest months in the year. As at all other tropical stations, the diurnal variations of the Barometer are here found to be so regular in their recurrence, that there are very few days in the year on which the atmospheric tides are not plainly discernible. The highest readings occur about 9½ A. M. The mercury then commences falling, and arrives at its lowest minimum a little before 4 P. M. The secondary maximum and minimum occur during the night, at 10 P. M. and 3½ A. M. respectively, but are far less marked than those observed during the day. The greatest daily range occurs in March, and the least in December. The mean temperature, although somewhat higher at Madras than at many other parts of the Presidency, is subject to such small changes, that the severe extremes which elsewhere prove so prejudicial to health are never experienced.

The Dew Point, or Temperature at which rain would begin to fall if the air were suddenly cooled down thereto, does not rise and fall conformably to the temperature; for though its greatest depression below the Dry Bulb (13°·2), occurs during the hottest month, June, the least difference (6°·6) falls in October, when the temperature nearly agrees with the average of the whole year. The per-centage of Humidity changes but slightly; the average amount of aqueous vapour in the atmosphere being exactly three-fourths of the whole quantity sustainable thereby. The average Rain-fall is deduced from observations extending over a period of fifty-two years, viz., from 1804 to 1807, and again from 1813 to 1860. The dryest year on record was 1832, when only 18½ inches of rain were collected: the greatest quantity fell in 1827, when nearly 89 inches were recorded. In October 1857, not less than 37¾ inches fell; while no shower occurred throughout the first five months of 1860. By summing up separate portions of this column, it will be found, that under ordinary circumstances only about a tenth part of the year's rain falls during the first five months, but a full half at the setting in of the N. E. Monsoon, in October and November. It is also worthy of remark, that, whereas in Europe, a rain gauge placed on the ground invariably collects more than one elevated, some forty or fifty feet, in India the case is reversed. The difference is slight, but the upper gauge receives *more* than the lower one.

As regards the Wind nothing very definite can yet be pronounced, in consequence of the imperfect instrumental registration employed, which has

rendered the past observations scarcely worthy of reduction. It is however certain that the prevalent notion as to the force of the wind in the tropics, is a vastly exaggerated one, and that the daily average of pressure or velocity, is much less than in England. The general laws as to direction are so strongly marked as to be evident to the most casual observer of natural phenomena. The North-east monsoon, heralded by heavy rain, sets in about the end of October, and blows pretty steadily, but not strongly except during accidental gales, until February. South and South-east winds prevail from then until May, in which month some of the most violent storms on record have occurred. The long but mild four months reign of the South-west monsoon then becomes fairly established. The scorching westerly or land winds, which blow in the forenoon in May, are relieved by a refreshing sea breeze, which, commencing about noon, continues until evening. The general tendency of the wind when changing, is, to veer round in a direct order, i. e., following the course of the Sun, or E. S. W. N. E. During rough or unsettled weather this order is reversed, being retrograde, or E. N. W. S. E.; and frequent instances might be adduced, when with calm fine weather at Madras, rain and stormy weather within one or two hundred miles distance, has been plainly indicated, by no other mark than a retrograde change in the direction of the wind.

N. R. POGSON,
Government Astronomer.

APPENDIX VII.

BEING A BRIEF REPORT UPON THE COTTON EXHIBITED AT THE MADRAS EXHIBITION OF 1859.

BY HOWARD B. MONTGOMERY, M. D., &c.

Reporter on Fibres.

At the request of Mr. Wheeler, and under the sanction of the Hon'ble Mr. Morehead, President of the Exhibition Committee, I have drawn up the following abstract from the remarks on the Cotton Fibres examined by me as Reporter on the Fibres exhibited at the Madras Exhibition of 1859.

The objects I purpose here displaying are :—

(1.) The place of production of each specimen ;

(2.) The name of the Exhibitor ;

(3.) The quality of each specimen as to colour, strength, lustre, general preparation and suitability for export to England or elsewhere ;

These appear to be the items which are of the greatest interest in connection with Mr. Wheeler's labours, and I defer to a future opportunity other points of enquiry in connection with the general topic of Cotton Cultivation in this Presidency.

I may premise that at the Exhibition of 1859 there were 42 Exhibitors who furnished 53 specimens of Cotton as will be seen by the following tabular statements in the preparation of which I was much assisted by my friend Dr. Hunter, Superintendent of the School of Arts.

It will be observed however that in the following tables there are three specimens of *Silk Cotton* alluded to which do not properly come under further review at present. They appear only in consequence of their being included in the printed Catalogues of the Exhibition under the heading Gossypium Species. In them they were numbered 6470–6497 and 6498.

Dr. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON (Gossypium, Sp.)

Specimen.	Exhibitor and Articles.	District grown.	Remarks.
1	Messrs. Fischer and Co. .... Salem. Bourbon Cotton	Salem .... ,,	*Bourbon Cotton.* Very good, soft fine strong fibre long staple well cleaned: fit for export. *2nd Prize—(equal).*
2	Messrs. Fischer and Co. .... Salem. Bourbon Cotton	Salem .... ,,	Do. Do.
3	Messrs. Fischer and Co. .... Salem. Ooppum Cotton	Salem .... ,,	Good slightly harsh strong fibre medium staple, well cleaned, fit for export.
4	Revenue Board .... Madras. Laudum Cotton grown by Messrs. Fischer and Co. and obtained the 1st prize.	Salem	Very good, soft fine fibre long staple, well cleaned, fit for export.

DR. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &c.—(*continued.*)

Specimen.	Exhibitor and Articles.	District grown.	Remarks.
5	C. Elliott, Esq. .... Nagpore. Cotton Indigenous.	Nagpore	Uncleaned Cotton, harsh strong curled fibre, short staple not in a fit state for export.
6	Dr. Short, ... Chingleput. Chemparty Cotton	Chingleput .... ”	Indifferently cleaned, Cotton Sp: not known, slightly harsh strong fibre, medium staple not in a fit state for export.
7	Captain Templar .... Chingleput. This is cleaned Cotton grown from Egyptian seed—This Cotton was introduced into the Chingleput district by Captain Templar, and is now grown by Natives of the district from seed distributed by Captain Templar (valued by Messrs. Arbuthnot and Co., 75 Rs. per candy.	Chingleput.	Beautifully cleaned Egyptian Cotton, fine, strong, soft fibre, long staple, fit for export. *1st Prize.*

8	Revenue Board .... Madras. (Bourbon Cotton grown by Messrs. Fischer and Co., and obtained 1st prize.)	Salem.	*Bourbon Cotton* carefully prepared: of very good, soft, fine, strong fibre, long staple, well cleaned, fit for export. *Probably same as Nos.* 1. *and* 2.
9	Revenue Board .... Madras. Ooppum Cotton grown by Messrs. Fischer and Co., and obtained the 1st prize.	Salem.	Good, slightly harsh strong fibre, medium staple well cleaned fit for export. *Probably same as No.* 3.
10	Arnachella Moodelly .... Trichinopoly. Europe Cotton with Seeds	Trichinopoly..... „	Very good, probably American Cotton; fine, soft, strong fibre long staple, uncleaned, not fit for export in present state.
11	Local Committee .... Goa. Cotton	Goa. ... „	Good. Sp: unknown, tolerably fine, strong; but slightly harsh fibre medium staple, uncleaned, not fit for export.

DR. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &C.—(*continued.*)

Specimen.	Exhibitor and Article.	District grown.	Remarks.
12	Maha Rajah of Vizianagrum .... Vizianagrum. Poonasa-pratty (Indigenous Cotton.)	Vizianagrum.... ,,	Indifferent, country Cotton, harsh strong fibre, medium staple, not cleaned, not fit for export.
13	Local Committee .... Madura. Indigenous Cotton	Madura .... ,,	Either Brazil Cotton or from Gos: Ind: (Golcondah Cotton). Quite uncleaned, fibre slightly harsh, strong and curled : long staple, easily separable from the seeds which are aggregated and large and arranged in double rows : a good Cotton, might be exported.
14	Local Committee .... Madura. Cotton Indigenous ...	Madura .... ,,	Country Cotton. Good Cotton, slightly harsh, coarse, strong, curled fibre medium staple not cleaned : not fit for export in this state.
15	Revenue Board .... Madras. Nankeen Cotton grown by Messrs. Fischer and Co., and obtained the 1st prize at Salem.	Salem	Very good Nankeen Cotton, fine soft curled fibre, moderately strong, medium staple well cleaned—fit for export to China, is not in great demand in England. *Honorable mention.*

16	M. Murray, Esq. .... Cuddapah. Cotton Indigenous	Cuddapah .... "	Indifferent, Country Cotton, harsh strong fibre, short staple; badly cleaned though free from seeds, not fit for export in present state.
17	J. Ram Reddy .... Bellary. (Cotton 1st sort prize Specimen from local Exhibition).	Bellary	Good Country Cotton, soft, fine strong curled fibre, long staple, badly cleaned, not fit for export in present state.
18	F. S. Child, Esq. .... Paulghaut. Fibry Cotton Sp. unknown.	Paulghaut	Very good, soft fine strong fibre long staple, well cleaned, fit for export. (*4th Prize.*)
19	Local Committee .... Madura. Indigenous Cotton	Madura .... "	Uncleaned Cotton harsh, strong curled, fibre, short staple. Not in a fit state for export.
20	M. Murray, Esq. .... Cuddapah. Cotton Indigenous	Cuddapah .... "	Indifferently cleaned; Cotton Sp: not known, slightly harsh, strong fibre, medium staple. Not in a fit state for export.

DR. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &c.—(*continued.*)

Specimen.	Exhibitor and Article.	District grown.	Remarks.
21	Local Committee .... Chingleput. Cotton Indigenous	Chingleput .... ”	Uncleaned Cotton : harsh strong curled fibre, short staple. Not in a fit state for export.
22	Local Committee .... Madura. Indigenous Cotton	Madura .... ”	Do. do. do.
23	Local Committee Hydrabad .... Oomer Khan Hydrabad. Uncleaned Cotton	Hydrabad .... ”	Do. do. do.
24	Local Committee ...... Chingleput. Cotton Indigenous	Chingleput .... ”	Uncleaned Cotton harsh strong curled fibre, very short staple, not in a fit state for export, is probably of little use.

25	Arnachella Moodelly …… Trichnopoly. Golcondah Cotton and seeds …..	Trichinopoly …. „	Quite uncleaned, fibre slightly harsh, strong and curled, long staple, easily separable from the seeds which are aggregated and large and arranged in double rows a good cotton, might be exported. *This is probably derived from Brazil seed.*
26	Local Committee …… Nandair, Hyderabad. Colored Cotton …..	Hyderabad …. „	Indifferently cleaned, Cotton Sp: not known, slightly harsh, strong fibre, medium staple, not in a fit state for export.
27	Local Committee …… Nandair, Hyderabad. Uncleaned country Cotton ……	Hyderabad …. „	Uncleaned cotton, harsh strong curled fibre, short staple, not in a fit state for export.
Ex.No. (6470.)	Hanoomunt Row ……. Bellary. Cotton (silk) ……	Bellary …. „	(Silk Cotton), fine, soft weak fibre, very short staple, well cleaned, fit for export, may be used for stuffing pillows, bedding or for paper with a stronger fibre.—*Erroneously exhibited in this class.* *Honorable mention.*
28	Narroyadoo …… Guntoor. Red Cotton ……	Guntoor …. „	Nankeen Cotton, good pale fine soft curled fibre, moderately strong, indifferently cleaned, medium staple, scarcely equal to No. 15 which see but might be exported. *Honorable mention.*

DR. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &c.—*(continued.)*

Specimen.	Exhibitor and Article.	District grown.	Remarks.
29	Ooneir Khan ...... Hyderabad. Cleaned Cotton	Hyderabad .... ”	Probably American, soft fine strong fibre, good staple, indifferently cleaned, fit for export, but might be much improved by superior cleaning. The seeds are very easily separated.
30	Local Committee .... Madura. Cotton	Madura ...... ”	Probably American Cotton. Good Cotton ; but quite uncleaned, fibre soft, strong and curled, very long. Staple fit for export if cleaned. *(Honorable mention.)*
31	Revenue Board .... Bellary. American Cotton	Bellary	American Cotton. Good Cotton ; fibre, soft and strong, medium staple, well cleaned ; fit for export. Seeds easily separated.
32	R. N. Taylor, Esq. ...... Raichore Dooab. American Cotton	Raichore Dooab... ”	American Cotton. Good, slightly harsh, strong elastic curled fibre, medium staple, uncleaned and thus not fit for export. *(Honorable mention for foreign species.)*

33	R. N. Taylor, Esq. ...... Raichore Dooab. Sea Island Cotton	Raichore Dooab... ,,	Sea Island Cotton. Good fibre, soft, fine and strong, long staple uncleaned, not fit for export in present state. (*Honorable mention for foreign species.*)
34	R. N. Taylor, Esq. ...... Raichore Dooab. Raichore Cotton	Raichore Dooab... ,,	Indifferent, slightly harsh strong fibre, short staple uncleaned unfit for export.
35	Appoodian ...... Trichinopoly. Cotton	Trichinopoly ... ,,	Coarse, indifferent, harsh strong curled fibre short staple uncleaned, unfit for export is probably indigenous or the produce of deteriorated foreign seed.
36	Maha Rajah of ...... Vizianagrum. Cotton (doubtful species)	Vizianagrum	Indifferent, harsh, coarse, strong curled fibre, long staple: unfit for export. This Cotton might prove valuable if more carefully cultivated vide p. I.
37	Revenue Board ...... Madras. Bourbon Cotton	Salem	Bourbon Cotton. Duplicate of No. 1.

Dr. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &c.—(*continued.*)

Specimen.	Exhibitor and Article.	District grown.	Remarks.
38	R. N. Taylor, Esq. .... Raichore Dooab. Black Cotton	Raichore Dooab.... ”	Indifferent, harsh, coarse, strong curled fibre, short staple: unfit for export. Is probably some variety of indigenous Cotton.
39	R. N. Taylor, Esq. ...... Raichore Dooab. Egyptian Cotton	Raichore Dooab.... ”	Egyptian Cotton fine soft fibre of fair strength, medium staple, uncleaned, moderately adherent to the seed, unfit for export in present state. *Honorable mention for foreign species.*
40	Local Committee ...... Kurnool. Cotton	Kurnool ...... ”	Country Cotton, good but has a very large amount of seed which is easily removed. A very fine soft Cotton, of medium strength, good staple, uncleaned and therefore unfit for export.
41	Local Committee .... Kurnool. Cleaned Cotton	Kurnool	Fibre soft stong elastic, short staple, indifferently cleaned and in this state unfit for export, is probably indigenous.

42	Local Committee ...... Kurnool. Cleaned Cotton.	Kurnool .... " ...	Country Cotton. Fibre, soft strong and curled, short staple, indifferently cleaned and scarcely fit for export in consequence.
43	C. Elliott, Esq. .... Nagpore. Cotton uncleaned.	Nagpore ..... "	Uncleaned Cotton, harsh strong curled fibre, short staple, not in a fit state for export. Country Cotton.
44	Moofty Sudr Ameen ..... Guntoor. Cotton.	Guntoor.	Ditto. Ditto.
45	Local Committee .... Madura. Indigenous Cotton. ...	Madura ..... "	Ditto. Ditto.
46	Local Committee ..... Madura. Cotton.	Madura	Indifferently cleaned Cotton. Sp. not known, slightly harsh, strong fibre, medium staple, not in a fit state for export.

DR. MONTGOMERY'S REPORT ON THE FIBRES OF COTTON, &c.—(*continued.*)

Specimen.	Exhibitor and Article.	District grown.	Remarks.
47	Local Committee ...... Madura. Indigenous cleaned Cotton.	Madura	Uncleaned Cotton, harsh strong curled fibre, short staple, not in a fit state for export.
48	C. Elliott, Esq. ...... Nagpore. Cleaned Cotton	Nagpore .... ”	Fibre harsh strong and curled, short staple not well cleaned scarcely fit for export in consequence. Species not known.
49	Local Committee ..... Madura. Indigenous Cotton	Madura .... ”	Uncleaned Cotton harsh, strong, curled fibre, short staple not in a fit state for export.
50	Local Committee ...... Madura. Indigenous Cotton	Madura ...... ”	Fibre harsh, coarse, elastic, very short staple, uncleaned, seeds very adherent and of very small size, unfit for export.

51	Nursing Row ...... Vizagapatam. Cotton Indigenous	Vizagapatam	Fibre harsh, coarse elastic, very short staple uncleaned dirty in color, seeds very adherent and of very small size, unfit for export.
52	Hon. W, Morehead, Esq. ..... Madras. Cotton grown in Chingleput	Chingleput ..... ,,	Egyptian Cotton. Very good, fine, soft and strong fibre long staple, very well cleaned, fit for export. *(2nd Prize equal.)*
53	Local Committee ...... Chingleput. Cotton Thread	Chingleput .... ,,	Good Cotton thread fit for export well laid up and of good colour and quality. *Honorable mention as a good specimen of Thread composed of Cotton grown in the district.*
Ex.No. (6497.)	Local Committee ...... Goa. Silk Cotton	Goa	(Silk Cotton.) Fine soft weak fibre, very short staple uncleaned and therefore unfit for export. *Erroneously exhibited in this class.*
Ex.No. (6498.)	W. S. Nisbet, Esq. ...... Chittoor. Silk Cotton	Chittoor .... ,,	(Silk Cotton.) Fine soft weak fibre, very short staple, well cleaned fit for export. Stuffing pillows for bedding or for paper if used with a stronger fibre. *Erroneously exhibited in this class.*

An analysis of the foregoing remarks will show that the following places were represented as supplying Cotton.

Of the 53 specimens exhibited :—

Salem	supplied	8,	of which one was Nankeen Cotton besides 4 foreign species.
Nagpore	„	3,	„ all were unfit for export.
Chingleput	„	6,	including one specimen of thread.
Trichinopoly	„	3,	„ 2 foreign species.
Goa	„	1,	(uncleaned specimen) doubtful species.
Vizianagram	„	2,	both unfit for export.
Madura	„	10,	including 2 good foreign varieties.
Cuddapah	„	2,	indigenous species only.
Bellary	„	2,	one exotic, one native.
Paulghaut	„	1,	of doubtful character.
Hyderabad	„	4,	of which one was exotic.
Guntoor	„	2,	including one good Nankeen.
RaichoreDooab	„	5,	„ 3 of foreign species.
Kurnool	„	3,	all indigenous
Vizagapatam	„	1,	of native origin.

Total...53—15 foreign—11 doubtful, and 27 indigenous.

As regards the nature of the Cottons Exhibited the following may be observed as to the productions of each district on the foregoing list.

To contrast the contributions of all districts it would perhaps be better to tabulate the sources, and varieties of supply. By doing this we may gain some insight into two points of importance, firstly as to the proved capability of certain districts to produce Exotic Cotton, and secondly, as to the nature of *it*, if so cultivated, and also of the *indigenous* Cotton now under review *as exhibited.*

In the following we therefore see the place of supply of all Cottons ; the number of these which were of exotic species and of the varieties of native Cotton ; and, as regards both descriptions, the suitability or otherwise of these for exportation. The points relied on in this respect were the length of staple and the cleaned or uncleaned condition of the sample ; for unless satisfactory in these respects the fibre could not be recommended as a profitable export, or to be relied on as such.

Table of 15 Supplying Districts, showing the number of Samples Exhibited and the proportion of these fit and unfit, respectively, for Exportation.

PRODUCING DISTRICTS.	IMPORTED SPECIES.					GENERAL RESULTS.	DOUBTFUL.		GENERAL RESULTS.	INDIGENOUS.		GENERAL RESULTS.	Total Results of all Cottons of each District.		Total.
	Bourbon.	Egyptian	Sea Island.	American.	Brazil.		?	Nankeen.		Oopum.	Sp. not known.				
Salem..	4/0	..	..	..	..	4/0	1/0	1/0	2/0	2/0	..	2/0	8/0	fit / unfit	8
Nagpore.	..	..	..	..	..	..	0/1	..	0/1	..	0/2	0/2	0/3	fit / unfit	6
Chingleput.... ...	..	2/0	..	..	..	2/0	thread 0	..	1/0	..	0/3	0/3	3/3	fit / unfit	
Trichinopoly.	..	..	...	0/1	1/0	1/1	..	..	..	..	0/1	0/1	1/2	fit / unfit	3
Goa......	..	..	..	..	..	..	0/1	..	0/1	..	..	..	0/1	fit / unfit	1
Vizianagram.	..	..	..	..	..	..	0/1	..	0/1	..	0/1	0/1	0/2	fit / unfit	2
Madura....... ..	..	..	..	1/0	1/0	2/0	0/1	..	0/1	..	0/7	0/7	2/8	fit / unfit	10
Cuddapah.	..	..	..	..	..	..	..	..	..	..	0/2	0/2	0/2	fit / unfit	2
Bellary..........	..	..	..	..	1/0	1/0	..	..	..	..	0/1	0/1	1/1	fit / unfit	2
Paulghaut.	..	..	..	..	..	..	1/0	..	1/0	..	..	..	1/0	fit / unfit	1
Hydrabad.........	..	..	..	1/6	..	1/0	0/2	..	0/2	..	0/1	0/1	1/3	fit / unfit	4
Guntoor....	..	..	..	..	..	..	..	1/0	1/0	..	0/1	0/1	1/1	fit / unfit	2
Raichoor Dooab ..	..	0/1	0/1	0/1	..	0/3	..	..	..	..	0/2	0/2	0/5	fit / unfit	5
Kurnool....	..	..	..	..	..	..	..	..	..	..	0/3	0/3	0/3	fit / unfit	3
Vizagapatam.	..	..	..	..	..	..	..	..	..	..	0/1	0/1	0/1	fit / unfit	1
Fit for export.....	4	2	0	2	3	11	3	2	5	2	0	2	18		
Unfit for do	0	1	1	2	0	4	6	0	6	0	25	25	35		
Total Exhibit....	4	3	0	4	0	15	9	2	11	2	25	27	53		

To summarize the above it may be said that, about 73 per cent. of the Exotic Cottons were fit for Export—the 4 unfit specimens only wanting addition care in preparation :

Of the doubtful species nearly 45 per cent. were fit for Export including one of very good thread.

Of the indigenous Cottons only 2 specimens—or 7½ per cent only were found worthy of recommendation.

The cause of this was three-fold, and these items may be enumerated as exemplifying the three great defects in native Cotton and native production.

1st. Short staple (only to be obviated by improved culture and the introduction of exotic varieties or by hybridizing native Cotton with the pollen of foreign produce.)

2ndly. *Partial or total absence of cleaning* (not only from seeds but from leaves, sand and dirt either intentionally introduced or accidentally acquired.)

3rdly. The harsh and curled fibre (due to the natural shortness of it and to want of irrigation of the crop.)

The standard of excellence was perhaps pitched higher at the time of the exhibition than it would *now* be, when there is extensive demand for all staples. But, unless marked improvement should be effected on the points above indicated, native Cotton can never compete with exotic Cotton carefully grown even in India.

It is worthy of remark that cost of production formed no item of the information placed at my disposal by exhibitors : and in the absence of this and of positive means of knowing the market value of each kind of Cotton I am unable to do more than institute an arbitrary distinction been the decidedly saleable and the probably unsaleable commodity.

As to the classification by varieties contained in the last table, I should add that in many instances (as the table itself shows) no reliable conclusion could be arrived at and the distinct species of 34 of the 53 specimens could not be determined. Of these however 9 appeared to be foreign varieties and 25 indigenous. This conclusion was arrived at from a careful examination of the fibre, seeds, &c., of each specimen.

Some of the Cottons exhibited were beautiful articles : and if large quantities of equal quality could be produced, they would command ready and good sale. But, in exhibitions such as that now under review there is no test applied as to the quantity grown and a carefully prepared "garden specimen" may be rewarded, although if the cost of its production were known it would be found to be worse than useless as an export intended to realize a profit on cost of production &c. To this and other branches of the subject I shall advert hereafter but I feel it right now to guard my readers against drawing other than general conclusions from the facts here recorded. The producing power of certain districts may be apparently overstated : as in the case of *Salem* which was represented by one exhibitor chiefly and some of the specimens from his plantation were three or four times brought to notice with approval.

The very fine quality of the Bourbon Cotton produced by this gentleman, of the Egyptian by Honorable Mr. Morehead and Captain Templar and the excellence of all specimens of Brazil Cotton should not be lost sight of by intending Cultivators. Nor should it be forgotton that Nankeen Cotton of good quality was exhibited from the districts of Salem and Guntoor.

As this occasion presents me with a suitable opportunity for doing so : I desire to record the following awards at the exhibition for the article of true Cotton fibre.

Captain Templar	1st prize	1st class	medal	for Cotton
Messrs. Fischer and Co.	2nd prize equal	do	do	do
Honorable W. Morehead Esq.		do	do	do

Messrs. Fischer and Co. Honorable mention for Nankeen Cotton
F. S. Child Esq. do do Cotton
Hanamunt Row do do
Narrayadoo do do Nankeen Cotton
Local Committee of Madura do do Cotton.
R. N. Taylor Esq. do for introducing 3 varieties of exotic Cotton, onlywanting in careful preparation.
Local Committee Chingleput, Honorable mention for Cotton thread.

HOWARD B. MONTGOMERY, M.D.
Reporter on Fibres for the Madras Exhibition of 1859.

FORT ST. GEORGE,
Madras 1861.

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N. B.—The numerals refer not to the Pages but to the No. of the Paras.

Adonie Talook, 88.

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